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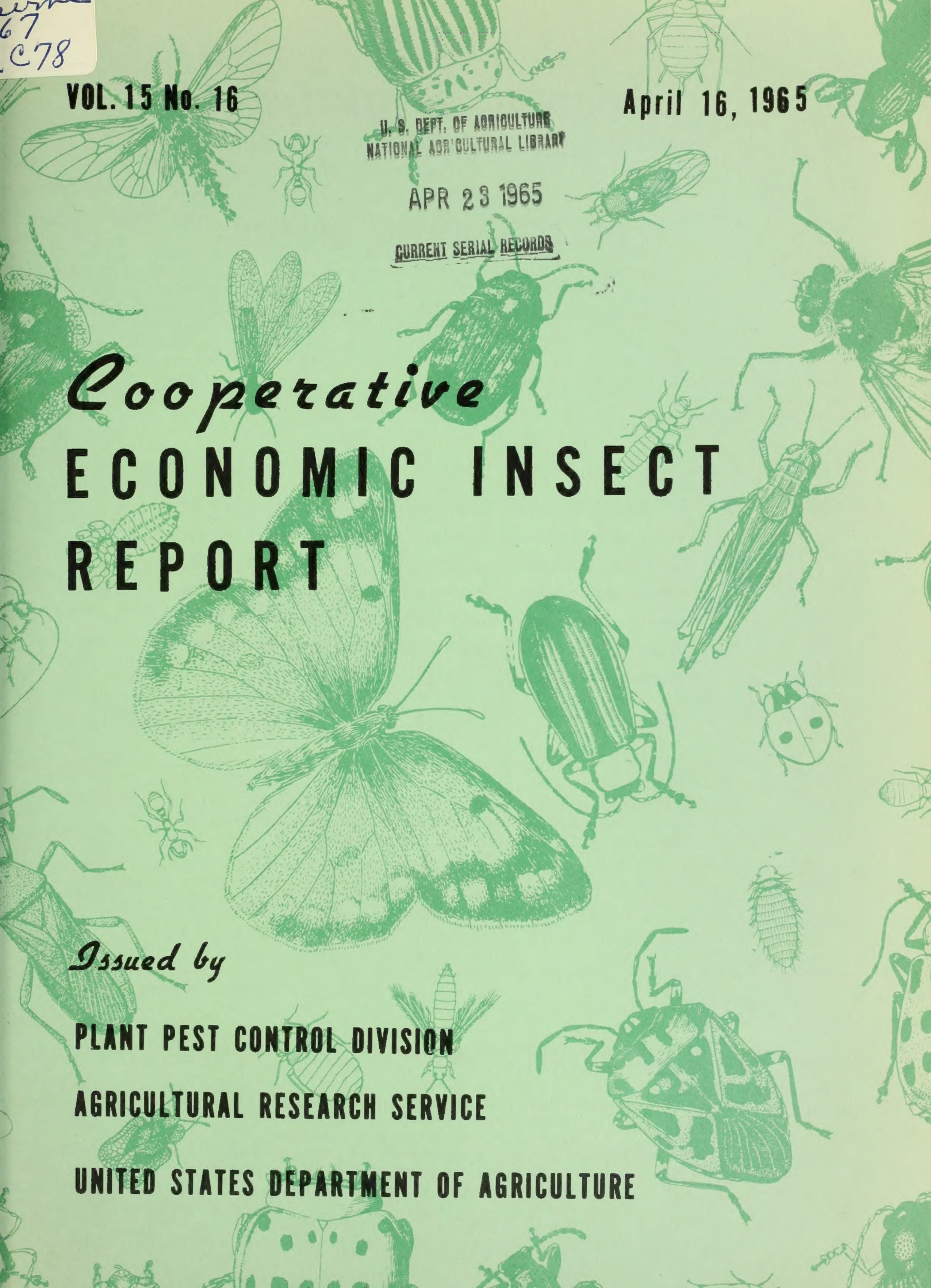

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Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 15 April 16, 1965 Number 16

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS:

ALFALFA WEEVIL very active in Delaware, larvae numerous in eastern and central Maryland, populations widespread in areas of Alabama, and adults active in Illinois and Utah. Few adults noted in Colorado but no adult activity in Wyoming. CLOVER LEAF WEEVIL larvae caused conspicuous injury to alfalfa and clover in several Maryland fields. (p. 335). PEA APHID on alfalfa and clover in Ohio; increasing rapidly on alfalfa in many areas of Oklahoma and increasing on vetch in Kaufman County, Texas; first buildup of season on alfalfa in central Arkansas. (p. 336). GREENBUG present in most wheat checked in central, south central and southwest Oklahoma; considerable spraying underway in some areas. Pea aphid caused total loss of wheat at one location in Texas. (p. 337). CORN LEAF APHID and ENGLISH GRAIN APHID damaging wheat in Poston area of Arizona; some controls applied. (pp. 337, 338). ARMYWORM moderate to heavy and damaging oats in Brazos County, Texas. (p. 338).

APHIDS and ORCHARD MITES becoming active in orchards in several States. (p. 338). First PLUM CURCULIO of season in North Carolina taken from peach tree in Moore County. (p. 339). TOBACCO FLEA BEETLE and SOUTHERN MOLE CRICKET damaging tobacco in Georgia. (p. 341).

BOLL WEEVIL winter survival survey completed in Alabama. Counts reported in CEIR 15(15):312-314 have been recalculated. (p. 341). BOLLWORM larvae very light and feeding on cotton in Gila Valley, Arizona. First moth of season taken at Kelso, Arkansas. (p. 341).

A CONIFER SAWFLY (*Neodiprion taedae linearis*) apparently as widespread, or more so, than in 1964 in Arkansas. (p. 342). CALIFORNIA OAKWORM larvae heavy on oaks in many areas in California; moths appeared early this season. (p. 343). TENT CATERPILLARS (*Malacosoma* spp.), ELM LEAF BEETLE, ELM CALLIGRAPHA and a FLEA BEETLE (*Blepharida rhois*) reported active in several States. (p. 343). HORN FLY active in Oklahoma and Georgia. (p. 346).

CORRECTIONS and ADDITIONAL NOTES

See page 349.

DETECTION

New State records include: A DARKLING BEETLE (*Alphitobius laevigatus*) in Illinois (p. 347); BLACK VINE WEEVIL (*Brachyrhinus sulcatus*) in Wisconsin (p. 365); and a WHITEFLY (*Aleurotuberculatus similis*) in Rhode Island (p. 369). New county records reported were: a THRIPS (*Kurtomathrips morrilli*) from San Diego County, California, (p. 344); an ANT (*Eciton nigrescens*) from Bryan County, Oklahoma, (p. 348); EUROPEAN EARWIG (*Forficula auricularia*) from Wexford and Lenawee Counties, Michigan, (p. 370); and WESTERN DRYWOOD TERMITE (*Incisitermes minor*) from Washoe County, Nevada, (p. 370).

SPECIAL REPORTS

Quarterly Insect and Mite Outlook in Florida - April through June. (pp. 339-340).

Citrus Insect Situation in Florida - End of March. (p. 340). GLOVER SCALE near record high and in high range. APHID populations at lowest level in 14 years of record.

Status of the Screw-worm in the Southwest. (p. 345). Single case discovered in Cochise County, Arizona, is first report in State since late November 1964.

(continued on page 334)

Estimated Losses and Production Costs Attributed to Insects and Related Arthropods Attacking Sorghums and Barley in Arizona in 1964. (p. 351).

Summary of Insect Conditions in the United States - 1964

Forest Insects. (p. 352).
Shade Tree Insects. (p. 356).
Ornamental Insects. (p. 363).

Reports in this issue are for week ending April 9, unless otherwise indicated.

* * *

WEATHER OF THE WEEK ENDING APRIL 12

HIGHLIGHTS: (1) Tornadoes, severe, most fatalities of record, northern Indiana, nearby areas. (2) Floods, severe, Minnesota, Iowa. (3) Strong warming, second week, central United States. (4) Rainy, most sections.

TEMPERATURE: The long-retarded spring season got a big boost as average temperatures climbed to 6° to 10° above normal from the southern Rockies to the southern Alleghenies. The contrast with previous cold was very striking; in 2 weeks average temperatures were 20° to 30° warmer from the Rockies to the Appalachian Chain. But while the East was thawing, temperatures dropped to 5° to 12° below normal over Arizona and southern California.

PRECIPITATION: Daily rains in southern California totaled about 2 inches for the week along the south coastal area making 2-week totals of 3 to 4 inches in that area; an unusual pattern. Parts of Arizona had the 5th week of light to moderate precipitation. Precipitation was also frequent with generous amounts in most other areas except that Florida and the gulf coast were dry and also the area from eastern Colorado and western Kansas southward to the border. Heavy snows fell in some mountain areas with 21 inches on the ground at Flagstaff, Arizona. Snow cover persists near the central Canadian border and in the upper Great Lakes area but is diminishing. Rains averaging near 1.5 inches in Minnesota augmented the flooding there.

TORNADOES: With strong warming, scattered tornadoes occurred in Arkansas, Oklahoma, Missouri, and West Virginia. On Sunday, April 11, the worst tornado disaster in the history of that area came to northern Indiana and neighboring sections including parts of Wisconsin, Illinois, Michigan, and Ohio. At least 3 dozen separate tornadoes caused more than 230 fatalities, thousands of injuries, and damage well over $100 million. Characteristic of tornadoes in this area, movement was rapid toward the east or northeast with most of the activity during late afternoon or evening. (Summary supplied by U.S. Weather Bureau).

CEREAL AND FORAGE INSECTS

ALFALFA WEEVIL (Hypera postica) - DELAWARE - Adults very active in alfalfa in one area of New Castle County. (Burbutis). MARYLAND - Larvae appearing in numbers on alfalfa in eastern and central sections. First and second-stage larvae infesting 75 percent of stems in one Talbot County field. In Howard County, adults decreased in numbers since January; apparently natural mortality; however, remaining adults laying eggs. Numerous adults swept from hairy vetch on April 8 at Upper Marlboro, Prince Georges County. (U. Md., Ent. Dept.). ALABAMA - Medium to heavy, widespread populations reported on alfalfa in Lawrence and Colbert Counties. Excessive rains in some areas prevented application of controls. (McClendon, Sommerville). OHIO - First and second-stage larvae noted in 20-75 percent of alfalfa terminals in Lawrence County; 6 fields checked. Up to 20 percent of terminals infested with first-stage larvae in Gallia and Meigs Counties. Adults collected at night. Alfalfa approximately 3-4 inches high. (Niemczyk). ILLINOIS - Adults found April 5; first of season. Check of alfalfa at 11:00 p.m. showed 32 adults per 100 sweeps; only 3.5 adults per 100 sweeps taken during daylight check on April 6. Mating common; eggs being laid on old alfalfa stems. Feeding punctures noted but no eggs found on green stems. Some first-stage larvae, not positively determined, may be this species. (Dysart). WYOMING - No adult activity noted in Washakie County alfalfa. (Marks). COLORADO - Few overwintering individuals collected in intensive check of alfalfa in Larimer County; numbers very sparse. (Daniels, Simpson, Ronald). UTAH - Adults active at Green River, Emery County, and at Mapleton, Utah County. (Knowlton).

CLOVER LEAF WEEVIL (Hypera punctata) - MARYLAND - Larvae causing conspicuous injury to alfalfa and clover in several fields in Anne Arundel and Prince Georges Counties. (U. Md., Ent. Dept.). OHIO - Larvae noted in red clover near Portsmouth, Scioto County. Det. by B. D. Blair. (Seithers). ILLINOIS - Survey (mostly in areas not checked previous week) confirmed low counts of 0-22 per square foot. Counts this week ranged 2-16 per square foot. Larvae collected week ending April 2, twenty-six percent infested with undetermined hymentopterous larvae. H. punctata larvae collected week ending April 9 showed 45 percent to be infested with hymenopterous larvae. (Ill. Ins. Rpt.). OKLAHOMA - Larvae ranged 6-24 per square foot in alfalfa checked in Beckham, Washita, Roger Mills and Woods Counties. Averaged one per square foot in Garfield County alfalfa. (Okla. Coop. Sur.).

LESSER CLOVER LEAF WEEVIL (Hypera nigrirostris) - ILLINOIS - Adults and larvae noted in low numbers on red clover and alfalfa in southern half of State. (Ill. Ins. Rpt.).

A WEEVIL (Hypera brunneipennis) - ARIZONA - Larval populations decreasing rapidly in alfalfa in Yuma and Maricopa Counties. (Ariz. Coop. Sur.).

BEAN LEAF BEETLE (Cerotoma trifurcata) - ARKANSAS - Small numbers (8-12 per 100 sweeps) noted on alfalfa in central area. (Ark. Ins. Sur.).

ALFALFA CATERPILLAR (Colias eurytheme) - MARYLAND - Moderate numbers of medium-sized larvae swept from vetch at Upper Marlboro, Prince Georges County. (U. Md., Ent. Dept.). UTAH - Adults noted at Moab, Grand County. (Knowlton).

VARIEGATED CUTWORM (Peridroma saucia) - TEXAS - Overwintering moths laying eggs on vetch and oats in Brazos County. (Randolph).

FORAGE LOOPER (Caenurgina erechtea) - ILLINOIS - Larvae varied 0-2 per 100 sweeps in southern area clover and alfalfa. (Ill. Ins. Rpt.).

ARMY CUTWORM (Chorizagrotis auxiliaris) - UTAH - Few larvae noted in alfalfa at Moab, Grand County, and at Green River, Emery County. (Knowlton).

PEA APHID (Acyrthosiphon pisum) - MARYLAND - Averaged 2 per sweep on alfalfa in Talbot County and 35 per sweep on vetch, with some winged forms present, at Upper Marlboro, Prince Georges County. (U. Md., Ent. Dept.). OHIO - Noted in alfalfa and clover near Lucasville, Scioto County; averaged 15 per 50 sweeps. (Freytag, Rose). ILLINOIS - Populations varied 70-1,520 per 100 sweeps in clover and alfalfa in southern half of State. (Ill. Ins. Rpt.). ARKANSAS - First buildup of season noted on alfalfa in central area; counts range 200-300 per 100 sweeps. Numbers slightly lower in northwest. (Ark. Ins. Sur.). OKLAHOMA - Numbers increasing rapidly in alfalfa in many areas; counts as high as 1,000 per 10 sweeps reported in Garvin County and 2,000 per 10 sweeps in Pottawatomie County. Counts reached 300 per square foot in Woods County, but much lighter in Woodward County. Averaged 400 per square foot in Tillman County; light to moderate in Cotton County. Generally light in southwest area and in Garfield County. (Okla. Coop. Sur.). TEXAS - Light, widespread populations in Kaufman County vetch beginning to increase; some scattered, heavy populations now present. (Turney). Heavy locally on alfalfa in Brazos County; counts as high as 100 per sweep on 10-inch alfalfa. (Randolph, Van Cleave). NEW MEXICO - Continues light on alfalfa in Dona Ana, Luna, Hidalgo, Valencia, Bernalillo and Sierra Counties. Infestations heavy in Roswell, Dexter and Hagerman areas of Chaves County with lighter numbers south into Eddy County. Controls now underway in this area; fair to good results being obtained. (N.M. Coop. Rpt.). ARIZONA - Light to medium on alfalfa in Graham, Greenlee and Cochise Counties. Populations decreasing in Yuma and Maricopa Counties. (Ariz. Coop. Sur.). NEVADA - Heavy in fields checked in Lovelock, Pershing County. (Ferraro).

SPOTTED ALFALFA APHID (Therioaphis maculata) - ARIZONA - Light to medium in alfalfa in Graham, Greenlee and Cochise Counties. Averaged 2 per trifoliate leaf in Graham County. (Ariz. Coop. Sur.). NEW MEXICO - Light infestations, with an occasional heavier population, noted in alfalfa in Dona Ana, Luna, Hidalgo, Sierra, Chaves and Eddy Counties. (N.M. Coop. Rpt.). TEXAS - Very light on vetch and burclover in local areas of Brazos County. (Randolph). ARKANSAS - Surveys negative in central area. (Ark. Ins. Sur.).

YELLOW CLOVER APHID (Therioaphis trifolii) - ILLINOIS - Ranged 0-7 per square foot in red clover in southern area. (Ill. Ins. Rpt.).

APHIDS - ALABAMA - Medium to heavy on Caley peas in Lowndes, Dallas and other Black Belt Counties. (Gerald et al.). TEXAS - Aphis craccivora (cowpea aphid) common but light on terminal growth of burclover in Brazos County. (Van Cleave).

TARNISHED PLANT BUG (Lygus lineolaris) - ILLINOIS - Adults varied 0-10 per 100 sweeps in clover and alfalfa in southern half of State. (Ill. Ins. Rpt.). OHIO - Ranged 2-3 per 50 sweeps in Scioto County alfalfa. (Blair, Rose). MARYLAND - Overwintered adults averaged 4 per sweep on vetch at Upper Marlboro, Prince Georges County. (U. Md., Ent. Dept.). FLORIDA - Total of 10 adults and 9 nymphs collected in 100 sweeps of blue lupine (Lupinus hirsutus) at Gainesville, Alachua County, April 7. (Mead).

LYGUS BUGS (Lygus spp.) - UTAH - Moderately numerous on mustards at Green River, Emery County, and Moab, Grand County; some also noted on alfalfa. (Knowlton).

CLOVER LEAFHOPPER (Aceratagallia sanguinolenta) - UTAH - Moderate on alfalfa at Green River, Emery County. (Knowlton). OHIO - Small numbers noted in alfalfa near Lucasville, Scioto County. (Freytag, Rose).

THRIPS - NEW MEXICO - Light in alfalfa in Dona Ana, Luna, Sierra, Chaves and Eddy Counties; light to moderate on field margins in Chaves and Eddy Counties. (N.M. Coop. Rpt.). ARIZONA - Medium populations of Frankliniella spp. caused light damage to new seedling alfalfa in Graham County. (Ariz. Coop. Sur.).

CLOVER MITE (Bryobia praetiosa) - NEVADA - Heavy on clover lawns in Yerington, Lyon County. (Batchelder). ARKANSAS - Becoming numerous; ranged 10-15 per square foot in one of three fields of alfalfa in northwest; noted on ryegrass and reported entering homes in southwest area. (Ark. Ins. Sur.).

GRASSHOPPERS - SOUTH DAKOTA - Nymphs of 2 species (slant-faced species that normally overwinter in this stage) observed March 30 on southern side of hill north of Spearfish airport, Lawrence County. Third-stage nymphs ranged 1-3 per square yard. Hillside on open rangeland and extension of field of alfalfa. Snow ranged 1-3 inches deep in area except on southern slopes of hills, which were clear. Temperature approximately 77° F. (Jones). OKLAHOMA - Light numbers of Melanoplus spp. first-stage nymphs noted on roadsides and crop margins in Atoka and Coal Counties (southeast) and Johnston County (south central). Unspecified adults active in Murray County (south central). (Okla. Coop. Sur.). FLORIDA - Two Schistocerca americana (American grasshopper) adults collected in 100 sweeps of blue lupine at Gainesville, Alachua County, April 7. (Mead).

A MEALYBUG (Phenacoccus graminosus) - CALIFORNIA - Heavy on Avena fatus (wild oat) and Bromus rigidus (ripgut grass) in Olivehurst, Yuba County, and on Stipa sp. (needlegrass) in Chico, Butte County. (Cal. Coop. Rpt.).

HARVESTER ANTS (Pogonomyrmex spp.) - UTAH - P. occidentalis (western harvester ant) active on rangelands throughout southern Emery County and in Grant County. (Knowlton). OKLAHOMA - P. barbatus (red harvester ant) active in Payne and Johnston Counties. (Okla. Coop. Sur.).

FLEA BEETLES - UTAH - Unspecified black species moderate on mustards at Moab, Grand County, and at Green River, Emery County. (Knowlton).

GREENBUG (Schizaphis graminum) - OKLAHOMA - Present in most wheat checked in central, south central and southwest areas; light in most areas but isolated heavy populations present. Considerable spraying has been done in some areas. Populations light in wheat in Caddo, Kay and Garfield Counties. Numbers low (less than one per linear foot) in barley checked in Logan and Garfield Counties. (Okla. Coop. Sur.). TEXAS - Ranged 600-2,000 per foot on one small, dryland field of wheat at Hereford, Deaf Smith County, April 6; many lady beetle larvae also present. S. graminum not heavy in general area, however. S. graminum generally 10-100 per foot of drill row in Deaf Smith County, April 9. Wheat large in most instances and shows no damage; however, one isolated dryland field had population of 2 to 4,000 per row foot with wheat almost total loss. (Daniels). Widespread, light populations present in Kaufman County small grains (Turney); very light on small grains locally in Brazos County (Randolph, Van Cleave).

CORN LEAF APHID (Rhopalosiphum maidis) - TEXAS - Light, locally on barley in Brazos County. (Randolph, Van Cleave). NEW MEXICO - Light to medium on spring seeded barley in Dona Ana, Luna and Sierra Counties. (N.M. Coop. Rpt.). ARIZONA - Damaging populations reported on wheat in Poston area, Pinal County. Controls necessary in some fields. Infestations light on barley in Graham, Greenlee and Cochise Counties. (Ariz. Coop. Sur.). CALIFORNIA - This aphid and other species light on barley plantings in Calexico, Imperial County. Light numbers of Lysiphlebus testaceipes (a parasitic braconid) also noted; has been present in many aphid infestations this spring. (Cal. Coop. Rpt.).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Noted in most wheat checked in central, southwest and south central areas; counts as high as 500 per linear foot in some areas. Heaviest counts found in Tillman and Kiowa Counties (southwest). Controls probably not necessary as species rarely causes noticeable damage to wheat in State. (Okla. Coop. Sur.). TEXAS - Complex of R. fitchii and R. padi, but mostly R. fitchii, ranged 5-20 per foot on wheat in Jones County, April 6. R. fitchii ranged 50-500 per foot in field of small grain in Deaf Smith County April 9. (Daniels). R. fitchii light to moderate in Kaufman County oats (Turney); occasional specimens noted in barley in Brazos County (Randolph, Van Cleave).

ENGLISH GRAIN APHID (Macrosiphum avenae) - ARIZONA - Heavy and damaging wheat in Poston area, Pinal County. Light to medium populations noted on small grains in Yuma and Maricopa Counties. (Ariz. Coop. Sur.). OKLAHOMA - Present in many fields of wheat throughout western two-thirds of State but numbers remain low in all areas checked. (Okla. Coop. Sur.).

STINK BUGS - FLORIDA - Following species collected in 50 sweeps of oats April 7 at Gainesville, Alachua County: Oebalus pugnax pugnax (rice stink bug) 3 adults; Nezara viridula (southern green stink bug) 4 adults; Euschistus servus (brown stink bug) 8 adults. (Mead).

LEAFHOPPERS - FLORIDA - Following species collected in 50 sweeps of oats at Gainesville, Alachua County, April 7: Graminella nigrifrons 3 adults; Agallia constricta 1 adult; Homalodisca insolita 5 adults. (Mead). H. insolita adults noted on oats on farm at Pensacola, Santa Rosa County, March 30. (Boyd).

ARMYWORM (Pseudaletia unipuncta) - TEXAS - Moderate to heavy local population damaging oats in Brazos County; larvae ranged 1-1.5 per square foot. (Randolph, Van Cleave). ARKANSAS - Moths numerous in light trap catches at Kelso and Hope. Moths observed on warm nights throughout past winter. (Ark. Ins. Sur.). FLORIDA - Few larvae collected in 50 sweeps of oats at Gainesville, Alachua County, April 7. (Mead).

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) - OKLAHOMA - Live larvae present in 20 percent of dry cornstalks checked in Washita County. (Okla. Coop. Sur.).

EUROPEAN CORN BORER (Ostrinia nubilalis) - NORTH DAKOTA - Spot check near Barney, Richland County, indicated reduction in borer population in area. Field conditions not condusive to general survey. (N.D. Ins. Sur.).

CORN FLEA BEETLE (Chaetocnema pulicaria) - ILLINOIS - Adults varied 40-230 per 100 sweeps in wheat and 110-800 per 100 sweeps in grass in west-southwest district. (Ill. Ins. Rpt.).

BROWN WHEAT MITE (Petrobia latens) - OKLAHOMA - Heavy rains caused considerable reduction of populations in many areas. Most counts ranged 0-50 per linear foot in southwest and south central areas. (Okla. Coop. Sur.). TEXAS - Becoming numerous on small grain in many parts of panhandle area April 6 and will continue so until advent of rain. Populations heavy in most areas of panhandle April 9. (Daniels). NEW MEXICO - Heavy in alfalfa along river levee north of Hatch, Dona Ana County. Widespread, light to heavy infestations reported in Chaves and Eddy Counties. (N.M. Coop. Rpt.).

FRUIT INSECTS

APHIDS - NEW JERSEY - Eggs of unspecified species hatching on apples at Richwood, Gloucester County. Controls urged. (Ins.-Dis. Newsltr.). DELAWARE - Aphis pomi (apple aphid) appearing on apple trees. (Late News, Apr. 9). OHIO - Rhopalosiphum fitchii (apple grain aphid) first instars observed on apple buds at Wooster, Wayne County, April 5. (Forsythe).

ORCHARD MITES - DELAWARE - Egg carryover heavy on apple trees. (Late News, Apr. 9). GEORGIA - Spider mites feeding on young apple leaves in Union County. (Taylor). OHIO - Hatch of overwintering Panonychus ulmi (European red mite) eggs began April 5 at Wooster, Wayne County. (Forsythe). COLORADO - Overwintering forms of Tetranychus telarius (two-spotted spider mite) active on apple trees in Mesa County April 1; few taken in soil samples from bases of trees. (Bulla). CALIFORNIA - Eriophyes pyri (pear leaf blister mite) medium locally on pear trees in Fresno, Fresno County. (Cal. Coop. Rpt.).

A NOCTUID MOTH (Orthosia hibisci) - OHIO - Large number of adults emerged at Wooster, Wayne County, April 6-7; species overwinters in pupal stage. (Rings).

GREEN PEACH APHID (Myzus persicae) - COLORADO - Eggs numerous on chokecherry in Larimer County; no evidence of hatching. (King, Daniels). UTAH - Nymphs present on peach at Moab, Grand County. (Knowlton). ARIZONA - Heavy and damaging terminal growth of peach trees in Graham County. (Ariz. Coop. Sur.).

OBSCURE SCALE (Chrysomphalus obscurus) - TEXAS - Heavy, locally in Bowie County orchards. (Turney).

SAN JOSE SCALE (Aspidiotus perniciosus) - CALIFORNIA - Locally heavy on peach in Ojai, Ventura County. (Cal. Coop. Rpt.).

BLISTER BEETLES - NORTH CAROLINA - Pomphopoea sp. damaged peach trees in commercial orchard in Cleveland County; degree of damage not known. (Dameron, Mount). TEXAS - Lytta aenea noted on peach and plum flowers and buds in Madison, Hood and Brown Counties. (Garrett, Hillman, McLure).

PLUM CURCULIO (Conotrachelus nenuphar) - NORTH CAROLINA - Adult collected on peach tree near Sandhills Research Station, Moore County, April 7; first report of season. (Smith, Mount).

EASTERN TENT CATERPILLAR (Malacosoma americanum) - TEXAS - Light, widespred populations on plums and native shrubs in Caldwell, Hays and Guadalupe Counties; larvae about 50 percent grown. (Texas Coop. Rpt.; Massey).

ORIENTAL FRUIT MOTH (Grapholitha molesta) - CALIFORNIA - Heavy adult flight indicated by trap catches in Hughson area, Stanislaus County, during first week of April. (Cal. Coop. Rpt.).

AN ANTHOMYIID FLY - TEXAS - Locally heavy on peach trees in Young County and pecans in Comanche County; causing concern to growers although no damage noted. (McCarroll, Dickson).

PHYCITID MOTHS (Acrobasis spp.) - GEORGIA - A. juglandis (pecan leaf casebearer) and A. caryae (pecan nut casebearer) light to moderate on pecan in southern area. (Johnson, Apr. 6). Both species much more active. (Osburn, Apr. 9).

AN ARMORED SCALE (Chionaspis caryae) - FLORIDA - Immatures taken on stem of pecan in nursery at Monticello, Jefferson County. (Miller, Mar. 30).

CUTWORMS - NEW JERSEY - Unusually large numbers found in trash under blueberry bushes. (Ins.-Dis. Newsltr.).

A BLASTOBASID MOTH (Holcocera sp.)- FLORIDA - Larvae severely damaged bark of mango tree at Hialeah, Dade County. (Swanson, Mar. 31). Larvae made tightly woven, thick web on entire west side of tree. (Fla. Coop. Sur.).

Quarterly Insect and Mite Outlook in Florida - April through June - This outlook is based on the assumption that weather beyond the period of the current U.S. Weather Bureau's 30-day outlook will be normal. Therefore, the forecast given below cannot be viewed with the same degree of confidence as those in the "Citrus Insect and Disease Summary" usually released twice each month.

CITRUS RUST MITE (Phyllocoptruta oleivora) population will be near average with about 25 percent of groves harboring moderate to heavy infestations through May. A strong increase is expected mid-May through June. Rapid increases by TEXAS CITRUS MITE (Eutetranychus banksi) in scattered groves are expected in April, becoming more general in May and continuing to a peak near average level in June. About 40 percent of groves will develop moderate to heavy infestations. The statewide population of CITRUS RED MITE (Panonychus citri) is expected to remain below average. A few groves will show heavy infestations in April with more groves, about 30 percent, having moderate to heavy populations at the June peak. SIX-SPOTTED MITE (*Eotetranychus sexmaculatus*) will increase to mid-May; however, fewer infestations than usual are expected to be important. YELLOW SCALE (*Aonidiella citrina*) and GLOVER SCALE (*Lepidosaphes gloverii*) populations will continue above average. Decrease will occur in April followed by increase in May and June. Increase by BLACK SCALE (*Saissetia oleae*) will start in late April and continue through June. Population is expected to be near normal, with about 40 percent of groves showing moderate infestation and 10 percent heavy infestation. Slight decrease by CHAFF SCALE (*Parlatoria pergandii*) is expected through June. Larval population of WHITEFLIES will increase in May to an above normal peak early in June. Population of MEALYBUGS is expected to be above normal with a few heavy infestations in scattered groves through June. (W. A. Simanton, (Citrus Expt. Sta., Lake Alfred)).

Citrus Insect Situation in Florida - End of March - CITRUS RUST MITE infested 54 percent of groves (norm 60 percent); 34 percent economic (norm 34 percent). Population is near normal and little change is expected. About 14 percent of groves will have important infestations. Highest districts are south and west. TEXAS CITRUS MITE infested 36 percent of groves (norm 32 percent); 16 percent economic (norm 13 percent). Population will increase from current low levels. Scattered heavy infestations will be important in young groves. Highest districts are west and south. CITRUS RED MITE infested 30 percent of groves (norm 66 percent); 5 percent economic (norm 40 percent). Population continues to be near the record low. Very few heavy infestations are expected. Highest district is west. SIX-SPOTTED MITE infested 11 percent of groves (norm 12 percent); none economic (norm 1 percent). Increase will occur, but few infestations will be important. GLOVER SCALE infested 85 percent of groves (norm 27 percent). Population is near the record high level and in the high range. PURPLE SCALE (*Lepidosaphes beckii*) infested 85 percent of groves; 15 percent economic. Population is near average; little change is expected. Highest districts are south and central. CHAFF SCALE infested 75 percent of groves; 15 percent economic. Although population is above normal, few infestations will be important. Decrease is expected. Highest districts are east and south. YELLOW SCALE infested 64 percent of groves; 19 percent economic. Population is near record high but infestations are not heavy at this time. Little change is expected. Highest districts are central and south. BLACK SCALE infested 27 percent of groves; 8 percent economic. Although population is currently at low level, it is above normal for March and will increase. APHID populations are the lowest in 14 years of record. Only a few infestations in young groves will be important. MEALYBUGS are presently unimportant; however, egg masses and mobile forms are present in above normal numbers on citrus trees and on *Bidens* sp. under trees. WHITEFLIES will continue above average abundance. Adults will increase; larvae decrease. (W. A. Simanton (Citrus Expt. Sta., Lake Alfred)).

CITRUS THRIPS (*Scirtothrips citri*) - ARIZONA - Increasing in commercial citrus groves in Yuma County. (Ariz. Coop. Sur.).

A SUBTERRANEAN TERMITE (*Reticulitermes hageni*) - FLORIDA - Taken on bark of grapefruit at Fort Lauderdale, Broward County. Det. by L. A. Hetrick. (Porter, Mar. 28). Found in areas between bark and apparently healthy wood; not burrowing. Injured tree at ground level upward to 10-12 inches. (Fla. Coop. Sur.).

TRUCK CROP INSECTS

APHIDS - SOUTH CAROLINA - *Myzus persicae* (green peach aphid) unusually abundant on pepper and tomato plants in greenhouses. (Nettles et al., Apr. 6). GEORGIA - Unspecified species light on strawberries in Lowndes County. (Thompson). *Brevicoryne brassicae* (cabbage aphid) light on cabbage in southern section of State. (Johnson). CALIFORNIA - Green peach aphid and *Macrosiphum euphorbiae* (potato aphid) medium on spinach in Sanger, Fresno County. Potato aphid and *Aphis craccivora* (cowpea aphid) infested several hundred acres of asparagus in Fresno County. (Cal. Coop. Rpt.).

POTATO PSYLLID (Paratrioza cockerelli) - NEVADA - Adults light on lycium south of Beatty, Nye County. (Bechtel).

BEET LEAFHOPPER (Circulifer tenellus) - WYOMING - Overwintering adults found on new growth of kochia and mustards in Washakie County. Averaged 0.31 leafhopper per square foot of host area. Largest populations found in river bottom areas; however, specimens collected in widely scattered areas. (Lowry, Patch, Marks).

COLORADO POTATO BEETLE (Leptinotarsa decemlineata) - GEORGIA - Light on commercial tomato plants in Tift and Worth Counties. (Ratcliffe). ALABAMA - Light locally in gardens in Covington County. A few adults observed leaving hibernation in central area. (Stephenson, et al.).

PEA LEAF MINER (Liriomyza langei) - CALIFORNIA - Heavy on romaine, radish and kale in San Francisco, San Francisco County. (Cal. Coop. Rpt.).

IMPORTED CABBAGEWORM (Pieris rapae) - GEORGIA - Light on cabbage in southern section of State. (Johnson).

A SPIDER MITE - GEORGIA - Heavy on strawberries in Lowndes County. (Thompson).

TOBACCO INSECTS

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - GEORGIA - Moderate to heavy on tobacco in plant bed and in field. (Johnson).

A WIREWORM - GEORGIA - Moderate on tobacco in Clinch County. (Harrison).

GREEN PEACH APHID (Myzus persicae) - GEORGIA - Light on tobacco in plant bed and in field. (Johnson).

SOUTHERN MOLE CRICKET (Scapteriscus acletus) - GEORGIA - Caused moderate damage to newly set tobacco in Lowndes and Colquitt Counties. (Girardeau, Trench).

COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis) - ALABAMA - Winter survival survey of ground trash completed in 4 counties. Counts in Dallas County (previously unreported) averaged 2,418 weevils per acre of ground trash. Counts shown in CEIR 15(15): 312-314, should be corrected to read as follows: Morgan County 462, Tuscaloosa County 1,008, Henry County 3,228. An average of 51 percent of weevils that entered hibernation in the fall of 1964 survived the winter. The average number of weevils found in the spring of 1965 was 2,372 compared with 215 in the spring of 1964. The 1965 figure is approximately 10 times as large as the 1964 figure. The significant observation is the live weevil count in the northern part of the State where over 50 percent of the cotton crop is grown. (McQueen).

BOLLWORM (Heliothis zea) - ARIZONA - Very light population feeding on 3-inch cotton in Gila Valley in Yuma County. (Ariz. Coop. Sur.). ARKANSAS - First moth of season taken in light trap at Kelso (southeast) on March 29. One moth taken at Kelso and 2 moths at Hope (southwest) on April 6. (Ark. Ins. Sur.).

PINK BOLLWORM (Pectinophora gossypiella) - ARIZONA - First adult of season emerged in experimental cage March 31 at Safford, Graham County. (Ariz. Coop. Sur.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

BARK BEETLES - CALIFORNIA - Epidemic populations of Ips sp. in Fowler area of Shasta-Trinity National Forest; 1,000 ponderosa pines killed on 100-acre stand. Trees killed in groups up to 50. Over 200 trees killed in 20-acre area in Pilgrim Creek area. (W. Jensen, USFS). TEXAS - Number of new infestations of Dendroctonus frontalis (southern pine beetle) found in detection flights during March remained low; 5 active multiple-tree infestations located week of March 15 over entire infested area in Hardin and Jasper Counties; contained estimated 120 brood trees. In addition to spots located on detection flights, 126 brood trees in Orange County located and controlled by ground survey; 3 trees controlled in southern Tyler County. Most activity found adjacent to older infestations which remained active late in 1964. Landowners urged to recheck areas for new infestations. D. terebrans (black turpentine beetle) attacking pulpwood-size loblolly and shortleaf pines in northeast Leon County; damage scattered over area about 10 acres. Scattered infestations on loblolly and shortleaf pines on National Forest land in Trinity and southeastern Houston Counties. No unusual damage by Ips avulsus, I. calligraphus and I. grandicollis reported during month. (Texas Forest Pest Comm., Mar. Rpt.; Williamson). ARKANSAS - Late cold temperatures held back activity of Ips spp. and Dendroctonus terebrans. There is always some local activity scattered over pine areas but infestations fewer than normal and only few trees attacked in each spot. Increase expected as temperatures rise. No real threat presently except in poor sites and thick plantings in need of thinning. (Ark. Forest Pest Rpt., Apr.).

WEEVILS - ARKANSAS - Adults of Hylobius pales (pales weevil) and Pissodes nemorensis (deodar weevil) collected consistently during past few months; however, first noticeable increase in H. pales occurred March 23 when 82 specimens collected in traps in Hempstead County. (Ark. Forest Pest Rpt., Apr.).

A CONIFER SAWFLY (Neodiprion taedae linearis) - ARKANSAS - Hatching of this species first observed March 9 in eastern Calhoun County south of Harrell. Observations March 24 showed hatching progressed but due to cold weather, larval development retarded. Samples of egg deposits taken March 24 showed approximately 77 percent of eggs hatched; about 15 percent nonviable; 8.5 percent appeared viable and probably will hatch. Preliminary observations indicate infestations to be as widespread,or more so, than in 1964. Foresters in area from Camden west to De Queen urged to be especially alert. Adults recovered east of De Queen last fall, but no egg deposits observed in that area. (Ark. Forest Pest Rpt., Apr.).

NANTUCKET PINE TIP MOTH (Rhyacionia frustrana) - OKLAHOMA - Adults numerous around small pines in Lake Texoma State Park, Marshall County; emergence not complete. (Okla. Coop. Sur.).

A PINE TIP MOTH - ARKANSAS - Emergence heavy in southern area by March 9; cold weather generally unfavorable since then. Controls urged to protect ornamental plantings. (Ark. Forest Pest Rpt., Apr.).

A GELECHIID MOTH ("Recurvaria" piceaella) - SOUTH DAKOTA - Needle miner, tentatively identified as this species, damaged majority of needles on 3 large spruce trees in Aberdeen, Brown County. Overwinters in larval stage within mined needles; feeding may occur for short periods in spring before pupation. Adults appear in late May or June. (Jones).

SILVER-SPOTTED TIGER MOTH (Halisidota argentata) - CALIFORNIA - Larvae appearing on 50 acres of Douglas-fir in Elk Mountain sale area in Mendocino National Forest. (L. C. Simmons, USFS).

PINE BARK APHID (Pineus strobi) - GEORGIA - Infesting white pines in Spalding County. (Beckham).

PINE NEEDLE SCALE (Phenacaspis pinifoliae) - OHIO - Infestations reported in Medina, Medina County, (Holdsworth); heavy on pine and spruce in Ohio Agricultural Experiment Station arboretum (Rings).

TENT CATERPILLARS (Malacosoma spp.) - FLORIDA - Larvae of M. disstria (forest tent caterpillar) causing considerable defoliation on Carolina ash at Gainesville, Alachua County. (Esser, Apr. 2). ALABAMA - First infestations of M. americanum (eastern tent caterpillar) this season; light and local on young leaves of post oak trees on Conecuh National Forest in Covington County. (Stephenson). TEXAS - M. disstria moderate to heavy on oak trees in Hays, Caldwell and Guadalupe Counties. (Texas Coop. Rpt.; Massey). UTAH - M. fragile (Great Basin tent caterpillar) hatching at Moab, Grand County, April 9. (Knowlton).

FALL CANKERWORM (Alsophila pometaria) - PENNSYLVANIA - Plans underway to control extensive outbreak in parts of north central area; treatment area approximately 100,000 acres in central Potter County and 4,000 acres in southwestern Tioga County. (Pa. Forest Pest Rpt., Feb. 26).

SPRING CANKERWORM (Paleacrita vernata) - NEBRASKA - Increasing adult activity noted past 2 weeks in Lincoln, Lancaster County. (Rhine).

GYPSY MOTH (Porthetria dispar) - CONNECTICUT - Scouting in 25 towns revealed 6 towns in Middlesex County with 58,000 acres heavily infested; 6 towns in New London County with 53,000 acres infested and 2 towns in New Haven County with 16,000 acres infested. No serious infestation in 8 towns. (Cooper, Turner; Mar. 8).

CALIFORNIA OAKWORM (Phryganidia californica) - CALIFORNIA - Locally heavy on oak trees in Fremont, Alameda County; moths appeared early this season. Larvae now heavy in many areas. (Cal. Coop. Rpt.).

A NOCTUID MOTH (Oncocnemis punctilinea) - NEVADA - Early stage larvae damaging ash tree foliage in Las Vegas, Clark County. (Bechtel, Zoller).

MOURNING-CLOAK BUTTERFLY (Nymphalis antiopa) - UTAH - Active at Moab, Grand County. (Knowlton).

ELM LEAF BEETLE (Galerucella xanthomelaena) - ARKANSAS - Adults leaving hibernation; homeowners in infested areas urged to control first generation. (Ark. Forest Pest Rpt., Apr.). OKLAHOMA - Adults active on elms in Stillwater area, Payne County; first report of season. (Okla. Coop. Sur.). COLORADO - Adults becoming active around homes in Mesa County. (Bulla).

ELM CALLIGRAPHA (Calligrapha scalaris) - OKLAHOMA - Adults present on American elms in Oklahoma City, Oklahoma County; first report of activity this year. (Okla. Coop. Sur.).

A FLEA BEETLE (Blepharida rhois) - OKLAHOMA - Adults feeding and mating on cutleaf sumac in Stillwater area, Payne County; first activity of season. (Okla. Coop. Sur.).

A PERIODICAL CICADA (Magicicada septendecim) - MARYLAND - Brood V expected to occur this year in scattered areas of Garrett County. (U. Md., Ent. Dept.).

OBSCURE SCALE (Chrysomphalus obscurus) - FLORIDA - Required controls on water oak in nursery at Tampa, Hillsborough County. (Meyer, Mar. 29).

APHIDS - CALIFORNIA - Acyrthosiphon pelargonii medium on pelargoniums in San Francisco, San Francisco County. Macrosiphum rosae (rose aphid) medium on agapanthus 'Lily of the Nile' plants in Fresno, Fresno County; plant commonly used for freeway and parkway plantings. Aphis fabae (bean aphid) heavy on lupines in Byron, Contra Costa County. (Cal. Coop. Rpt.). OKLAHOMA - Several species heavy on tulips in Payne and Noble Counties and on roses in Marshall County. Light to moderate and damaging euonymus in Cleveland County and evergreens in Garvin County, (Okla. Coop. Rpt.). ALABAMA - Macrosiphum rosae buildup continues on roses in central and southern areas; medium in Covington, Lee and other counties. (Stephenson et al.). ARIZONA - Macrosiphoniella sanborni (chrysanthemum aphid) heavy and damaging roses in Graham, Greenlee and Cochise Counties. *Acyrthosiphon pisum* (pea aphid) heavy in Graham and Greenlee Counties; causing much damage to roses and other ornamentals. (Ariz. Coop. Sur.). NEW MEXICO - *Cinara tujafilina* abundant on arborvitae in Las Cruces, Dona Ana County. (N.M. Coop. Rpt.).

WHITEFLIES - FLORIDA - *Paraleyrodes perseae* and *Crenidorsum* sp. severely damaged stem and leaves of *Anthurium* sp. at nursery at Tallahassee, Leon County; det. by L. M. Russell. (Miller, Mar. 15).

COCCIDS - MARYLAND - *Unaspis euonymi* (euomymus scale) heavy on euonymus at Baltimore; *Chionaspis furfura* (scurfy scale) heavy on pyracantha at Cumberland, Allegany County. *Diaspis carueli* (juniper scale) moderate on juniper at Cresaptown. (U. Md., Ent. Dept.). NORTH CAROLINA - Euonymus scale heavy on *Euonymus radicans* in Lee County; *Ceroplastes* sp. infested azalea twigs locally in Lee County. (Howell, Wray). *Fiorinia theae* (tea scale) infested camellia in Wayne County. (Goforth, Robertson). FLORIDA - All stages of tea scale severely damaging leaves of Burford holly in nursery at Port Orange, Volusia County. (Holley, Pott, Mar. 31). All stages of *Howardia biclavis* (mining scale) severely damaged stem of crape-jasmine in nursery at Delray Beach, Palm Beach County, (Long, Mar. 26); adults moderately damaging stems of *Ixora* spp. in nursery at Miami Springs, Dade County, (Herrmann, Mar. 30). Ixora plants stunted and showing severe leaf drop. (Fla. Coop. Sur.). *Eucalymnatus tesselatus* moderately damaged leaves of bottlebrush at Miami, Dade County. (Herrman, Mar. 30). OKLAHOMA - *Diaspis* sp. damaged redcedar in Cherokee County. (Okla. Coop. Sur.). NEW MEXICO - Unspecified species heavy on cottonwood in yard at Deming, Luna County. (N.M. Coop. Rpt.). CALIFORNIA - *Lecanium cerasorum* (calico scale) medium on dogwood nursery stock in Hayward, Alameda County; heavy on liquidamber trees locally in Sacramento, Sacramento County, and heavy on this host in Gilroy, Santa Clara County. *Diaspis cocois* (an armored scale) heavy on palm trees in Delano, Kern County, and medium on *Jubaea spectabilis* nursery stock in San Diego, San Diego County. (Cal. Coop. Rpt.).

BOXWOOD LEAF MINER (*Monarthropalpus buxi*) - NORTH CAROLINA - Heavy on boxwood in Iredell County. (Franklin, Robertson).

PEA LEAF MINER (*Liriomyza langei*) - CALIFORNIA - Heavy on daisy and chrysanthemum in San Francisco, San Francisco County. (Cal. Coop. Rpt.).

A LEAF ROLLER MOTH (*Platynota stultana*) - CALIFORNIA - Larvae caused heavy damage to leaves of greenhouse roses in Union City, Alameda County. (Cal. Coop. Rpt.).

THRIPS - CALIFORNIA - *Kurtomathrips morrilli* medium on morning-glory plants in San Diego, San Diego County; this is a new county record. *Frankliniella occidentalis* (western flower thrips) heavy on lupines in Byron, Contra Costa County. (Cal. Coop. Rpt.).

A SUBTERRANEAN TERMITE (*Reticulitermes* sp.) - FLORIDA - Light on stem of chrysanthemum 'Iceburg' in nursery at Alva, Lee County; det. by L. A. Hetrick. (Walsh, Nelson). Appeared to be feeding on pith of plant. (Fla. Coop. Sur.).

SPIDER MITES - ALABAMA - Major pests of azaleas and some other ornamentals; reported much heavier than usual in Tallapoosa, Lee, Mobile, Baldwin, Geneva and other counties. Heavy, localized infestation on roundleaf Japanese holly in Morgan County. (Hagler, Keeble, Webb, Baskin, Reynolds, et al.). FLORIDA - *Tetranychus telarius* (two-spotted spider mite) moderately damaged leaves of rose in nursery at De Land, Volusia County. (Roberts, Mar. 6).

INSECTS AFFECTING MAN AND ANIMALS

MOSQUITOES - MARYLAND - Third and fourth instars of *Aedes grossbecki* and second instars of *A. canadensis* abundant near Point Lookout Creek, St. Marys County. (Foster, Mallack).

STATUS OF THE SCREW-WORM (Cochliomyia hominivorax) IN THE SOUTHWEST

A single screw-worm case discovered in Cochise County, ARIZONA, during the period April 4-10 marks the first report of myiasis of this type in Arizona since late November. The Southwestern Eradication Area continues to be free of screw-worm cases. The Republic of Mexico reported 71 cases: Sonora 48, Tamaulipas 8, San Luis Potosi 2, Durango 5, Guanajuato 2, Veracruz 3 and Puebla 3. Total sterile screw-worm flies released: Texas 166,250, Arizona 600,000 and Mexico 84,863,200. Note: Report of March 21-27 (CEIR 15(14):280): 166,250 sterile screw-worm flies released on ground at Mission, Texas. Flies were not released over Texas rivers.

	Positive Cases		Negative Cases		Ratio of Positive Cases to 100 Cases Negative	
Year	Current	Cumulative	Current	Cumulative	Current	Cumulative
Table 1. Comparison of specimens reported during corresponding weeks 1963 and 1964 in Southwestern Eradication Area.						
1963	83	326	106	941	78.30	34.64
1964	7	19	268	1199	2.61	1.58
1965	0	4	129	744	0.00	.53
Table 2. Comparison of specimens reported during corresponding weeks and in a corresponding area in 1964 in the United States-Mexico Barrier Zone.*						
1964	7	187	34	281	20.58	66.54
1965	57	629	41	408	139.02	154.16
Table 2A. Mexican portion of Barrier Zone only.						
1964	0	167	0	71	0.00	235.21
1965	56	626	13	235	430.76	266.38

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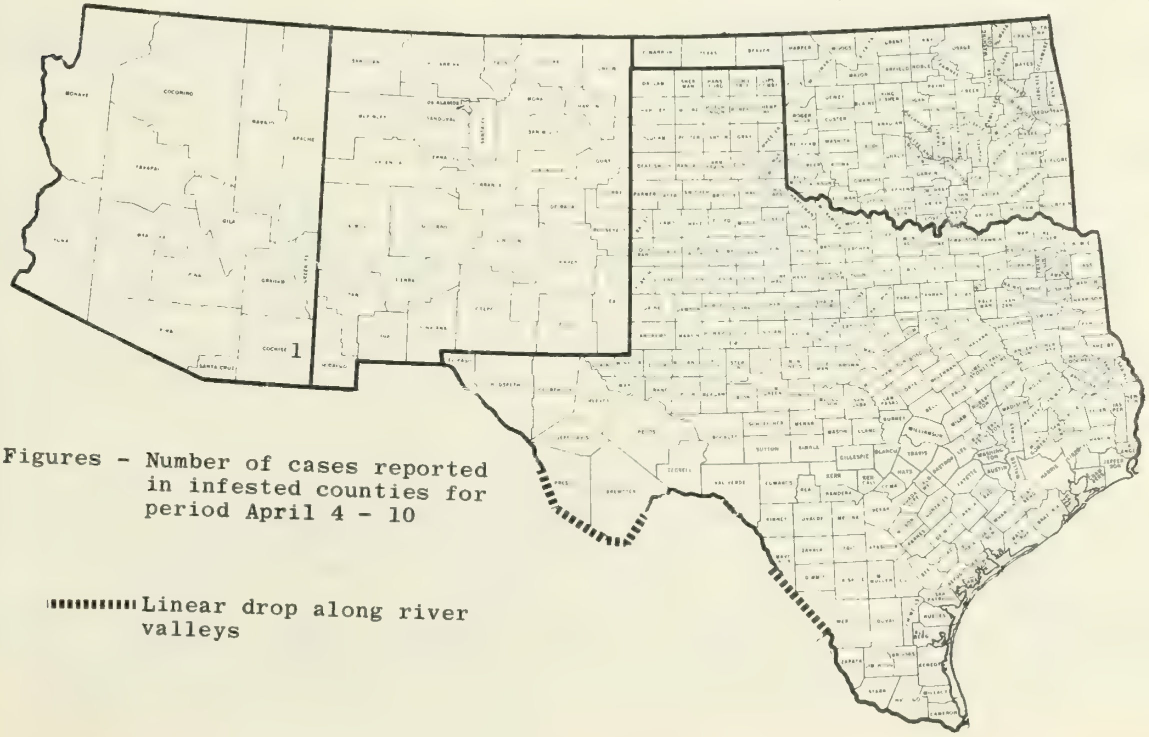
* Barrier Zone - Area in which screw-worm eradication operations are being carried out in an effort to prevent establishment of self-sustaining screw-worm population in the United States.

(Anim. Dis. Erad. Div.).



Figures - Number of cases reported in infested counties for period April 4 - 10

▮▮▮▮▮▮▮▮▮▮ Linear drop along river valleys

SECONDARY SCREW-WORM (Cochliomyia macellaria) - GEORGIA - Infesting wound of dehorned cow in Miller County. (Hennig).

COMMON CATTLE GRUB (Hypoderma lineatum) - OKLAHOMA - Adults numerous and annoying cattle in Hughes, Payne, Garvin and Cleveland Counties. (Okla. Coop. Sur.).

HORN FLY (Haematobia irritans) - OKLAHOMA - First adults of year active in Payne County. Averaged 10 per head on yearling steers. (Okla. Coop. Sur.). GEORGIA - Averaged 8.5 per animal in untreated herd in Spalding County. (Roberts).

FACE FLY (Musca autumnalis) - MISSOURI - Overwintering adults resting on sunny sides of buildings in Atchison County. (Houser, Thomas, Peters).

HOUSE FLY (Musca domestica) - OKLAHOMA - Averaged 5 per Scudder grid in untreated barns in Stillwater area, Payne County. (Okla. Coop. Sur.). ARKANSAS - Larvae appearing in poultry droppings in White County. (Barnes).

CATTLE LICE - SOUTH CAROLINA - Causing much scratching and rubbing, especially on beef cattle; backrubbers and sprays urged. (Nettles et al., Apr. 6). ALABAMA - Abundant on many herds in De Kalb and Bullock Counties. (Robinson, Stone). OKLAHOMA - Several species extremely heavy on cattle in Ellis County, heavy in Cotton County, and moderate in Payne, Kay, Mayes, Bryan and Hughes Counties. (Okla. Coop. Sur.). NEW MEXICO - Haematopinus eurysternus (short-nosed cattle louse) heavy to very heavy on 3 herds examined and Bovicola bovis (cattle biting louse) light to medium on one herd in Rio Arriba County. (N.M. Coop. Rpt.). UTAH - Cattle lice extremely numerous on some beef herds in Miller Creek area, Carbon County, (Knowlton, Horn); more numerous than normal in many unsprayed herds in Carbon, Emery, Grand, and San Juan Counties (Peterson, Knowlton). NEBRASKA - Linogathus vituli (long-nosed cattle louse) heavy on some herds in southwestern counties. (Roselle).

HOG LOUSE (Haematopinus suis) - UTAH - Common throughout the State. (Knowlton).

BED BUG (Cimex lectularius) - MARYLAND - Infested property at Severna Park, Anne Arundel County. (U. Md., Ent. Dept.). UTAH - Infesting home at Price, Carbon County. (Horn, Knowlton).

LONE STAR TICK (Amblyomma americanum) - MISSOURI - Adults and nymphs noted in Carter County. (Houser, Thomas, Peters). ALABAMA - Infestations reported in Franklin County. (Ponder).

HOUSEHOLD AND STRUCTURAL INSECTS

COCKROACHES - CONNECTICUT - Blattella germanica (German cockroach) infested home at Bridgeport, Fairfield County. (Savos, Apr. 7). DELAWARE - Blatta orientalis (oriental cockroach) heavy in home in New Castle County. (Kelsey). MINNESOTA - Numerous reports received concerning Parcoblatta spp. (wood cockroaches) in suburban areas of Minneapolis-St. Paul; populations very abundant in basements. Occasional specimen of Supella supellectilium (brown-banded cockroach) noted. (Minn. Ins. Rpt.). UTAH - German cockroach infesting lunch area in school at Price, Carbon County. (Horn, Knowlton). Oriental cockroach infesting motel at Green River, Emery County. (Knowlton).

ANTS - UTAH - Infesting several homes at Brigham City and Willard, Box Elder County. (Knowlton). OKLAHOMA - Unspecified ants reported in homes in Bryan County and Prenolepsis imparis swarmed in house in Payne County. (Okla. Coop. Sur.). MISSOURI - Adults of undetermined species observed in building in Atchison County. (Houser, Thomas, Peters). NEBRASKA - Nests of Camponotus pennsylvanicus (black carpenter ant) found in dying American elm trees in Frontier County. (Rhine). NORTH CAROLINA - Tapinoma sessile (odorous house ant) bothersome in homes in Wake County in late March. (Wray).

A MOTH FLY - MARYLAND - Adults causing nuisance in home in Prince Georges County. (U. Md., Ent. Dept.).

MILLIPEDS - MINNESOTA - Reported in basements and occasionally on first floors of homes in Minneapolis-St. Paul area. (Minn. Ins. Rpt.).

SAW-TOOTHED GRAIN BEETLE (Oryzaephilus surinamensis) - CONNECTICUT - Infested home at Groton, New London County. (Savos, Apr. 7). UTAH - Infesting flour and kitchens in several homes at Price, Carbon County. (Knowlton, Schofield).

INDIAN-MEAL MOTH (Plodia interpunctella) - UTAH - Infesting food in home in Logan, Cache County. (Davis, Knowlton).

BOXELDER BUG (Leptocoris trivittatus) - OHIO - Active in Bowling Green, Wood County, and Columbus, Franklin County. (Davidson, Holdsworth, Rose). INDIANA - Very abundant in home at Kokomo, Howard County. (Matthew).

ASSASSIN BUGS - OKLAHOMA - Melanolestes picipes and M. abdominalis active around lights in several areas of State. M. picipes annoying in house in Payne County. (Okla. Coop. Sur.).

CLOVER MITE (Bryobia praetiosa) - NEW JERSEY - Active in many areas. (Ins.-Dis. Newsltr.). DELAWARE - New infestations reported in homes in New Castle County. (Burbutis). UTAH - Invading many homes in Utah, Salt Lake, Weber, Davis, Box Elder and Cache Counties. (Knowlton). INDIANA - Heavy in home at Sellersburg, Clark County. (Matthew).

TERMITES -CONNECTICUT - Noted swarming at Warehouse Point, Hartford County; Groton, New London County; and Wethersfield, Hartford County. (Savos, Apr. 7). NEW JERSEY - Swarms continue to be homeowners'primary insect concern. (Ins.-Dis. Newsltr.). DELAWARE - Reticulitermes flavipes (eastern subterranean termite) adult flights indicate several new house infestations in New Castle County. (Burbutis).

OLD-HOUSE BORER (Hylotrupes bajulus) - ALABAMA - Larvae infested wooden walls of house trailer in Calhoun County for several months. (Pair).

AN EUCNEMID BEETLE - NORTH CAROLINA - Adults emerged from walls of new home in Edgecombe County. (Powell, Mount).

PAINTED HICKORY BORER (Megacyllene caryae) - NORTH CAROLINA - Emerged from firewood in home in Avery County. (Wray, Mar. 25).

STORED-PRODUCT INSECTS

A DARKLING BEETLE (Alphitobius laevigatus) - ILLINOIS - Found in decomposed soybean meal in Vermilion County in 1964. Det. by M. W. Sanderson, confirmed by T. J. Spilman. This is a new State record. (Ill. Ins. Rpt.).

KHAPRA BEETLE (Trogoderma granarium) - ARKANSAS - Surveys of 4 properties in Polk County were negative. (Ark. Ins. Sur., PPC).

BLACK CARPET BEETLE (Attagenus piceus) - NORTH DAKOTA - Trace numbers of adults and larvae in elevator at Wyndmere, Richland County. (Frye).

INDIAN-MEAL MOTH (Plodia interpunctella) - NORTH DAKOTA - Trace number of larvae in elevator at Wyndmere, Richland County. (Frye).

BENEFICIAL INSECTS

LADY BEETLES - TEXAS - Very light to light in Brazos County and in Denton County area. (Van Cleave, Randolph, Turney). ARKANSAS - Several species observed on alfalfa in central area; reproduction underway. (Ark. Ins. Sur.). ILLINOIS - Few adults of *Hippodamia convergens* (convergent lady beetle) and *H. parenthesis* active in clover and alfalfa fields in southern area. (Ill. Ins. Rpt.).

GREEN LACEWINGS (*Chrysopa* spp.) - ILLINOIS - Active in clover and alfalfa in southern area. (Ill. Ins. Rpt.). ARKANSAS - Adults active in central and northwestern areas. (Ark. Ins. Sur.). TEXAS - Adults numerous in Brazos County (Randolph); light in Denton County area (Turney).

DAMSEL BUGS (*Nabis* spp.) - ILLINOIS - Active in clover and alfalfa in southern area. (Ill. Ins. Rpt.). TEXAS - Very light to light in Brazos County and in Denton County area. (Van Cleave, Randolph, Turney).

A FLOWER BUG (*Orius insidiosus*) - ARKANSAS - Adults noted on alfalfa in central area. (Ark. Ins. Sur.).

A BIG-EYED BUG (*Geocoris punctipes*) - ARKANSAS - Adults found in small numbers in alfalfa in central area. (Ark. Ins. Sur.).

BRACONIDS - TEXAS - Very light to light in Brazos County and in Denton County area. (Van Cleave, Randolph, Turney). *Apanteles* sp. and *Lysiphlebus* sp. quite active in Brazos County small grains, vetch and alfalfa. (Randolph, Van Cleave).

MISCELLANEOUS INSECTS

IMPORTED FIRE ANT (*Solenopsis saevissima richteri*) - ALABAMA - Widespread and medium to heavy; considerable mound building noted in infested counties. (Reynolds, Sessions, Granberry, et al.). ARKANSAS - Additional infestations found at 3 locations in Ashley County. Surveys negative in Union, Lafayette and Little River Counties. (Ark. Ins. Sur.).

ANTS - OKLAHOMA - *Eciton nigrescens* found in Bryan County; new county record. (Okla. Coop. Sur.). TEXAS - *Atta texana* (Texas leaf-cutting ant) swarming over wide area of State, including Falls, Guadalupe and Lee Counties. (Spivey). OHIO - Very heavy swarms of *Acanthomyops* sp. noted along field borders near Lucasville, Scioto County. Det. by P. Freytag and F. Moore. (Blair, Rose).

A PLATYPODID BEETLE (*Platypus rugulosus*) - FLORIDA - Adults severe on stem of covellea tree (*Covellea racemosa*) in nursery at Miami, Dade County. (Herrmann, Mar. 18). It is not known whether this species will attack healthy trees but it may cause rapid decline after entering plants. This species is apparently well established in southern Florida; regularly collected in blacklight traps. (Fla. Coop. Sur.).

BLACK CARPET BEETLE (*Attagenus piceus*) - MICHIGAN - Larvae and adults numerous in packages of poison rat bait in Berrien County. (Shick, Apr. 2).

GREATER WAX MOTH (*Galleria mellonella*) - OKLAHOMA - Light in and around bee hives in Kay County. (Okla. Coop. Sur.).

WHITE-LINED SPHINX (*Celerio lineata*) - NEVADA - Adults numerous in southern part of State. (Zoller).

LUNA MOTH (*Actias luna*) - OKLAHOMA - Adults active for first time this year in Stillwater area, Payne County. Several collected in light traps. (Okla. Coop. Sur.).

CITRUS WHITEFLY (*Dialeurodes citri*) - CALIFORNIA - Treatment of 800 city blocks in Sacramento, Sacramento County, and 48 city blocks in Fresno, Fresno County, completed. Grid surveys continue; spot treatments will be applied where live nymphs occur. (Cal. Coop. Rpt.).

SPRINGTAILS - ALABAMA - Extremely heavy in lawns and fields in Calhoun and Cherokee Counties; general throughout State. (Pair, et al.).

CORRECTIONS

CEIR 15(14):280 - STATUS OF THE SCREW-WORM (Cochliomyia hominivorax) IN THE SOUTHWEST - First paragraph, lines 7 and 8 should read "... Sterile screw-worm flies released: 166,250 on ground at Mission, Texas. Flies were not released over Texas rivers; 75,795,200 in grid patterns over Mexico."

CEIR 15(15):312-314 - Report on Survival of Boll Weevil as Determined by Surface Trash Examinations During the Spring - 1965 - ALABAMA - Average number of live weevils per acre of trash should be changed on all 3 pages to read as follows: Morgan County 462, Tuscaloosa County 1008, Henry County 3228. (McQueen).

ADDITIONAL NOTES

INDIANA - Late-stage larvae of CLOVER LEAF WEEVIL (Hypera punctata) active on clover in south-southwest section; injury light. PEA APHID (Acyrthosiphon pisum) present on clover in south-southwest area. (Huber). SWEETCLOVER WEEVIL (Sitona cylindricollis) caused light injury to clover in southern quarter of State. (Huber, Everly). First-stage larvae of EASTERN TENT CATERPILLAR (Malacosoma americanum) active on wild cherry and apple in New Albany area of Floyd County. (Saugstad).

LIGHT TRAP COLLECTIONS

	Temperature °F.	Precipitation (inches)	Type of trap *	Agrotis ipsilon (black cutworm)	Carpocapsa pomonella (codling moth)	Chorizagrotis auxiliaris (army cutworm)	Estigmene acrea (salt-marsh caterpillar)	Faronta diffusa (wheat head armyworm)	Feltia subterranea (granulate cutworm)	Heliothis virescens (tobacco budworm)	H. zea (bollworm, corn earworm, tomato fruitworm)	Loxostege commixtalis (alfalfa webworm)	Loxostege similalis (garden webworm)	Loxostege sticticalis (beet webworm)	Ostrinia nubilalis (European corn borer)	Peridroma saucia (variegated cutworm)	Prodenia ornithogalli (yellow-striped armyworm)	Protoparce quinquemaculata (tomato hornworm)	Protoparce sexta (tomato hornworm)	Pseudaletia unipuncta (armyworm)	Spodoptera exigua (beet armyworm)	Spodoptera frugiperda (fall armyworm)	Trichoplusia ni (cabbage looper)	Crops **
ARKANSAS																								
Hope 4/1-7				18						0	2					2				20				
Kelso 3/23-4/7				86						0	2					2				76				
FLORIDA																								
Gainesville 4/5			BL						6		1													
GEORGIA																								
Tifton 3/25-31	52-79	1.8	BL							0	1							0	0					
MISSISSIPPI																								
Rolling Fork 4/1-8	51-82	1.16	BL	16					4		4									110				
Stoneville 4/2-8	51-82	1.16	MV	66												100	6			576				
Stoneville 4/1-8	51-82	1.16	2 BL	248							3					165	2			1814				
Tunica 4/6-7			BL	93							4					62	4			362				
MISSOURI																								
Portageville 3/20-4/9				2												4				4				
SOUTH CAROLINA																								
Charleston 4/5-11	50-86	None	BL	6					6	0	1					1	4	0	0	17		0		
TENNESSEE (Counties)																								
Madison 3/29-4/4																				16				
Maury 3/29-4/4				4													1			14				
Robertson 3/29-4/4																				8				
Cumberland 3/29-4/4				7													3			4				
Greene 3/29-4/4																	3			4				
Blount 3/29-4/4				2												1				2				
Johnson 3/29-4/4				1													2			2				
TEXAS																								
Brownsville 4/1-7	63-68	Trace	5 BL	2			6		2040		1060	394				105		9	6	57		164	503	
Waco 3/27-4/2			BL	3			6		14		4					37	10			92				
Waco 4/3-9			BL	28			67		25	0	35					135	5			173	0	0	0	

* BL = blacklight; I = incandescent; MV = mercury vapor; O = other

** alf. = alfalfa; beet = garden beet and/or sugar beet; cole = cole crops (crucifers); cott. = cotton; FC = field corn; grain = small grains; leg. = legumes (unspecified); lett. = lettuce; pean. = peanut; pepp. = pepper; pot. = potatoes; SC = sweet corn; sol. = solanaceous plants (unspecified); soy. = soybean; TC = truck crops (unspecified or mixed); tob. = tobacco; tom. = tomato.

ESTIMATED LOSSES AND PRODUCTION COSTS ATTRIBUTED TO INSECTS AND RELATED ARTHROPODS

IN Arizona (State or District) DURING 1964 (Year)

ATTACKING Sorghums (Commodity or Crop)

A. Pest or pest complex: Lygus bugs, fleahoppers, armyworms, corn earworm, cutworms, sorghum midge

B. Number of acres[a] produced (From CRS) No. 138,000

C. Average yield per acre[a] (From CRS) Units/ 69 bu.

D. Price[b] per unit (bu.)[c] (From CRS) $/ 1.26

E. Acres[a] needing control No. 125,000

F. Acres[a] treated No. 90,000

G. Reduction due to not treating where needed:

H. Loss in yield, percent % 12

I. Loss in yield, units per acre[a], C x H Units/ 8.28 bu.

J. Loss in yield, $ per acre[a], D x I $/ 10.43

K. Loss in quality, $ per ----[a] $/ ----

L. Yield loss for all acres[a], (E-F) x I Units 289,800 bu.

M. Control cost, $ per acre[a], $/ 3.50

N. Control cost for all acres[a], F x M $ 315,000

O. Yield loss for all acres[a], (E-F) x J $ 365,050

P. Quality loss for all ----[a], (E-F) x K $ ----

Q. Combined control cost and losses, N + O + P $ 680,050

R. Percent loss due to each insect in the complex:

Comment: Estimated Savings - $938,700

a. Acres, head of cattle or other producing units used by Crop Reporting Service.

b. Season average price per unit as given by CRS (describe basis).

c. Bushels, boxes, tons or other marketing units used by CRS; show which in ( ).

Submitted by Dale Fullerton

Date March 9, 1965

ATTACKING Barley (Commodity or Crop)

A. Pest or pest complex: Aphids, mites, cutworms, armyworms

B. Number of acres[a] produced (From CRS) No. 161,000

C. Average yield per acre[a] (From CRS) Units/ 75 bu.

D. Price[b] per unit (bu.)[c] (From CRS) $/ 1.15

E. Acres[a] needing control No. 130,000

F. Acres[a] treated No. 80,000

G. Reduction due to not treating where needed:

H. Loss in yield, percent % 5

I. Loss in yield, units per acre[a], C x H Units/ 3.75 bu.

J. Loss in yield, $ per acre[a], D x I $/ 4.31

K. Loss in quality, $ per ----[a] $/ ----

L. Yield loss for all acres[a], (E-F) x I Units 187,500 bu.

M. Control cost, $ per acre[a], $/ 4.00

N. Control cost for all acres[a], F x M $ 320,000

O. Yield loss for all acres[a], (E-F) x J $ 215,500

P. Quality loss for all ----[a], (E-F) x K $ ----

Q. Combined control cost and losses, N + O + P $ 535,500

R. Percent loss due to each insect in the complex:

Comment: Estimated Savings - $300,000

a. Acres, head of cattle or other producing units used by Crop Reporting Service.

b. Season average price per unit as given by CRS (describe basis).

c. Bushels, boxes, tons or other marketing units used by CRS; show which in ( ).

Submitted by Dale Fullerton

Date March 9, 1965

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1964

(continued from page 332)

FOREST INSECTS [1/]

Forward:

The consensus among leading insect taxonomists in the United States was to adopt Dr. Stephen L. Wood's 1963 Revision of the Genus Dendroctonus (Coleoptera : Scolytidae), (Great Basin Naturalist 23:1-117, illus.), and Dr. G. R. Hopping's 1964 Revision of the North American Species in Groups IV and V of Ips De Geer (Coleoptera : Scolytidae), (Canadian Entomologist 96:970-978, illus.). Accordingly, names assigned to the now-valid species are used in this report. For the convenience of the reader, rescinded names are carried in parentheses. However, accepted common names for all species have been retained, resulting occasionally in the use of more than one common name for a single species. Common names for the bark beetles are under study by the Common Names Committee of the Entomological Society of America.

Highlights:

Forest insect infestations in the United States in 1964 were smaller and less severe than in the previous few years. There were many outbreaks, however, that damaged or destroyed forest resources over large areas and were costly to contain. Other outbreaks recurred after several years of dormancy and a few were found at new locations. Many of the infestations, both new and recurring, will require suppressive action in 1965. As a group, BARK BEETLES were the most troublesome pests. Their persistent outbreaks in the Intermountain and Rocky Mountain States took a heavy toll. Lodgepole pine stands in Idaho, Utah and Wyoming were particularly hard hit, and chronic infestations seriously depleted high-value stands of western white pine in northern Idaho and ponderosa pine in the Rocky Mountains and in the Black Hills of South Dakota and Wyoming. At year's end, there was a resurge of PINE BEETLE infestations at several locations in the Southern and Southeastern States.

Forest DEFOLIATORS also were troublesome and damaging at many locations throughout the country. Noteworthy were new and virulent outbreaks of DOUGLAS-FIR TUSSOCK MOTH in California and Oregon. In addition, a serious FALL CANKERWORM infestation intensified and spread in valuable hardwood stands in Pennsylvania. SPRUCE BUDWORM remained epidemic in much of the mixed conifer forests of Montana, Idaho, New Mexico and Minnesota, and a new outbreak was discovered in southern Utah. LARCH CASEBEARER infestations increased in size and severity in northeast Washington and in the larch type through most of Idaho and Montana. The BLACK-HEADED BUDWORM population increased in southeast Alaska. Miscellaneous insect pests, including aphids, weevils, scale insects, shoot and tip moths, needle miners, leaf tiers, spittlebugs and many others, were troublesome locally in many sections of the country. Suppression of most infestations in 1964 was accomplished satisfactorily, and without undue or significant side effects.

Conditions in Alaska

The forest insect situation in ALASKA became increasingly critical with the continued buildup of BLACK-HEADED BUDWORM (*Acleris variana*) and HEMLOCK SAWFLY

[1/] This summary is the introduction or highlights section of the "Forest Insect Conditions in the United States - 1964" which was compiled and published by the Forest Service, U.S. Department of Agriculture. Copies of the complete annual summary are available upon request from the Regional Forester in your area. Addresses of the regional offices may be found on page 356 of this issue of the CEIR.

(Neodiprion tsugae) populations. On the other hand, BARK BEETLES were very scarce except for a relatively unimportant CEDAR BERK BEETLE (Phloeosinus squamosus). Hardwood DEFOLIATORS and SUCKING INSECTS occurred only in endemic numbers.

Conditions in Western Forests

The extensive coniferous forests in the Western United States have long been plagued with destructive insects, and the situation in 1964 was little changed.

In OREGON and WASHINGTON, the total acreage of infestations was the lowest in the past decade. However, the areas affected by DEFOLIATORS increased. Serious new outbreaks of DOUGLAS-FIR TUSSOCK MOTH (Hemerocampa pseudotsugata) developed in continuous stands of Douglas-fir, true firs and intermingled conifers in central Oregon. Also, new infestations of BALSAM WOOLLY APHID (Chermes piceae) developed in lowland white fir stands in the coastal range of southern Oregon, and LARCH CASEBEARER (Coleophora laricella) infestations increased in size and severity in northeast Washington.

The rapid buildup of Douglas-fir tussock moth in scattered areas from Modoc to El Dorado Counties dominated forest insect conditions in CALIFORNIA. Other pests important in previous years declined sharply. For example: The WESTERN PINE BEETLE (Dendroctonus brevicomis) was largely a local probelm, and the LODGEPOLE NEEDLE MINER ("Recurvaria" milleri) subsided to low levels.

In the Intermountain States, BARK BEETLES in lodgepole pine were the worst offenders and killed more than two million trees in epidemic centers in UTAH, IDAHO and WYOMING. DEFOLIATORS were damaging and destructive with SPRUCE BUDWORM (Choristoneura fumiferana) predominant among several. The gross area showing some defoliation by spruce budworm amounted to more than two million acres. The BLACK-HEADED BUDWORM (Acleris variana) became epidemic on about 40,000 acres, and an ASPEN LEAF TIER (Sciaphila duplex) continued epidemic on some 170,000 acres. Activity of a PITCH NODULE MOTH (Petrova albicapitana var. arizonensis) rose sharply in many pinyon pine stands. There was a general increase of the WHITE-FIR NEEDLE MINER (Epinotia meritana) in southern UTAH. With but two exceptions, both minor, Engelmann spruce stands in the Intermountain States were nearly free of BARK BEETLE activity.

The forests in the northern Rocky Mountains suffered attacks of BARK BEETLES and defoliation alike. Chronic MOUNTAIN PINE BEETLE, Black Hills beetle (Dendroctonus ponderosae (=D. monticolae)) infestations resulted in 3 to 14-percent losses in northern IDAHO white pine stands, and the same insect depleted ponderosa pine stands in parts of MONTANA. An epidemic of Douglas-fir tussock moth spread over 190,000 acres of grand and Douglas-fir type in IDAHO, and scattered outbreaks also occurred in MONTANA. Spruce budworm infestations continued at high levels on some 2.2 million acres in MONTANA and IDAHO, and the larch casebearer continued its spread in both States. FOREST TENT CATERPILLAR (Malacosoma disstria) epidemics severely defoliated broadleaf trees on large acreages in northern IDAHO.

The mountain pine beetle, Black Hills beetle, was the most serious forest insect in the central Rocky Mountains, but concerted effort by land-managing agencies checked most infestations. A potentially serious outbreak of the ENGELMANN SPRUCE BEETLE, Sitka-spruce beetle (Dendroctonus obesus (= D. engelmanni)) was discovered in the Green Horn Mountains in south central COLORADO, and a new outbreak of mountain pine beetle, Black Hills beetle, occurred on the Medicine Bow National Forest in south central WYOMING. Spruce budworm infestations in COLORADO forests increased in size and severity, with activity centered along the eastern slope of the Sangre de Cristo Range, San Isabel National Forest.

Insect activity increased in the Southwest. Spruce budworm infestations in southern NEW MEXICO spread from 50,000 to 90,000 acres and those on 350,000 acres in the northern part of the State intensified. An Engelmann spruce beetle, Sita-spruce beetle, infestation erupted on Mt. Taylor, and new outbreaks of PINE

BARK BEETLES seriously damaged ponderosa pine stands. The white-fir needle miner, previously unrecorded in the Southwest, damaged several thousand acres of white fir on the North Kaibab Plateau. The DOUGLAS-FIR BEETLE (*Dendroctonus pseudotsugae*) was particularly serious near Williams, ARIZONA, and a PINYON NEEDLE SCALE (*Matsucoccus acalyptus*)was again active at Grand Canyon National Park.

Conditions in the Central, Southern, Southeastern and Northeastern Forest Regions

Conifer DEFOLIATORS and hardwood BORERS were the most damaging insects in the Lake and Central States. The JACK-PINE BUDWORM (*Choristoneura pinus*) increased in number and became general throughout large areas in northern Lower MICHIGAN, WISCONSIN, and in central and north central MINNESOTA. The PINE TUSSOCK MOTH (*Dasychira plagiata*) also reached outbreak levels in parts of WISCONSIN. Moderate to heavy CARPENTERWORM (*Prionoxystus robiniae*) and WOOD BORER attacks on oaks continued at many locations in the Central States, and damage and degrade to attacked trees were severe.

The SOUTHERN PINE BEETLE (*Dendroctonus frontalis*) remained the most troublesome insect in the South and Southeast, and a resurgence late in the year portends serious losses in 1965. BLACK TURPENTINE BEETLE (*D. terebrans*) activity was local, but in the aggregate, killed many trees. The BALSAM WOOLLY APHID (*Chermes piceae*) killed many Fraser firs in the mountains of NORTH CAROLINA, and infestations were found at several new locations. A LOBLOLLY PINE SAWFLY (*Neodiprion taedae linearis*) was widespread in ARKANSAS and abundant at two locations in LOUISIANA.

Drought in the Northeast caused concern, especially in parts of PENNSYLVANIA and NEW YORK, where valuable hardwood stands were heavily defoliated by the FALL CANKERWORM (*Alsophila pometaria*) and OAK LEAF ROLLERS. New HEMLOCK SCALE (*Aspidiotus ithacae*) infestations are a potential threat to native hemlocks. Also, the RED-PINE SCALE (*Matsucoccus resinosae*) continued to spread slowly in southern NEW YORK and southwestern CONNECTICUT. Activity of the FOREST TENT CATERPILLAR (*Malacosoma disstria*), the HEMLOCK LOOPER (*Lambdina fiscellaria*) and the LARCH SAWFLY (*Pristiphora erichsonii*) increased in MAINE.

Suppression Activities

Federal and State agencies and owners and managers of private forest lands made concerted efforts during 1964 to check the damage and loss caused by insects. Overall, good progress was made in controlling virulent outbreaks of bark beetles and in suppressing widescale epidemics of forest defoliators. However, some infestations were unattended because of shortages of funds, lack of suitable control methods, or other reasons.

The largest control undertakings were against bark beetles in the Intermountain and Rocky Mountain Regions. Involved in the mountain pine beetle, Black Hills beetle, control in lodgepole pine stands on the Ashley, Wasatch, Cache, Caribou, Teton and Targhee National Forests in Idaho, Utah and Wyoming were felling and burning, salvage and spraying of more than 250,000 trees. Mountain pine beetle, Black Hills beetle, control in ponderosa pine in the Black Hills of South Dakota and Wyoming, the Big Horn Mountains in Wyoming, and the Front Range Mountains in Colorado, involved treatment of some 260,000 trees. Results against the beetles were reported as good. However, new infestations at other locations and maintenance work, particularly in lodgepole pine stands in Idaho and Wyoming, will require additional large-scale control operations in 1965.

Bark beetle control in the pine stands of the South and Southeast continued, but at a reduced rate. A total of 33 projects involved treatment of approximately 167,000 trees infested by the southern pine beetle and 650,000 trees and stumps infested by the black turpentine beetle.

The resurgence of southern pine beetle infestations at year's end in the South and Southeast portends a serious situation which might require an increase in control operations in 1965. Persistent infestations of the black turpentine beetle, particularly on parts of the Kisatchie National Forest, Louisiana, and on National Forests in Texas, also will require additional effort.

Spruce budworm suppression on the Salmon National Forest in Idaho and on the Lolo and Deerlodge National Forests, Montana, was the major effort against defoliating insects. Approximately 525,000 acres were sprayed on the Salmon National Forest, and some 155,000 acres were treated on the two National Forests in Montana. Intensive monitoring of these spray projects, increased use of helicopters in spray operations, and use of the more expensive nonpersistent pesticides increased the cost of these projects over previous years.

A summary of pest control operations for 1964 is presented in the following tabulation.

Pest Control Accomplishments

Project	Location	Trees treated	Acres sprayed
Mountain pine beetle	Utah, Idaho, Wyoming	249,000	
Black Hills beetle	South Dakota, Colorado, Wyoming	260,000	
Southern pine beetle	South and Southeast	167,000	
Black turpentine beetle	South and Southeast	654,000[1]	
Western pine beetle	California	12,500	
Engelmann spruce beetle	Colorado, Utah, New Mexico	8,600	
Spruce budworm	Idaho, Montana, Maine		775,000
Pine tussock moth	Wisconsin		8,500
Tent caterpillars	Southwest		2,500
Jack-pine budworm	Michigan		1,200
Miscellaneous insects	Countrywide	86,000	3,400
Total		1,437,100	790,600

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[1] Includes treating of stumps.

REGIONAL OFFICE ADDRESSES

U. S. FOREST SERVICE

Region

1 U. S. Forest Service
Federal Building
Missoula, Montana 59801

2 U. S. Forest Service
Federal Center
Building 85
Denver, Colorado 80225

3 U. S. Forest Service
New Federal Building
517 Gold Street, S. W.
Albuquerque, New Mexico 87101

4 U. S. Forest Service
Forest Service Building
Ogden, Utah 84403

5 U. S. Forest Service
630 Sansome Street
San Francisco, California 94111

Region

6 U. S. Forest Service
P. O. Box 3623
Portland, Oregon 97208

7 U. S. Forest Service
6816 Market Street
Upper Darby, Pennsylvania 19082

8 U. S. Forest Service
50 Seventh Street, N. E.
Atlanta, Georgia 30323

9 U. S. Forest Service
710 N. Sixth Street
Milwaukee, Wisconsin 53203

10 U. S. Forest Service
Fifth Street Office Building
P. O. Box 1631
Juneau, Alaska 99801

SHADE TREE INSECTS

Highlights:

FALL WEBWORM was unusually heavy on shade trees throughout Indiana and populations were high in south central and southwest Missouri. Infestations were not as abundant in Louisiana as they were in 1963 and populations were not as heavy in New Mexico as for the past four years. Fall webworm has all but vanished from western Washington. CANKERWORMS, including FALL CANKERWORM and SPRING CANKERWORM, were of concern in some New England States, in western New York, several areas in Lower Michigan and heavy at a few locations in California. Several TENT CATERPILLARS were of concern in various States from the Atlantic to Pacific Oceans, as were various other Lepidoptera.

ELM LEAF BEETLE was severe in Grant County, Washington, was a problem in many areas of California, and new infestations found in Arizona apparently indicate a very rapid and widespread dispersal in that State. Elms were damaged and/or defoliated in New Mexico, Colorado, Nebraska, Kansas, Missouri, Illinois, Oklahoma, Texas, Arkansas and other Southern States as well as in New York and some of the New England States. LARGER ELM LEAF BEETLE was more extensive and severe in the Piedmont area of North Carolina than in previous years. LOCUST LEAF MINER was reported in three new counties in Illinois and SMALLER EUROPEAN ELM BARK BEETLE was found for the first time in Nevada, as well as being of concern in several of the States where it is known to occur.

Various SCALE INSECTS and some APHIDS were of concern and caused varying degrees of damage to shade trees throughout the Nation during the past season.

FALL WEBWORM (Hyphantria cunea) populations were light on various hardwoods in southern MAINE in late July, being noticeably below 1963 levels. This arctiid moth was present statewide in RHODE ISLAND, but inconspicuous and spotty except for concentrations in Jamestown, Newport County. First hatch of this pest in the State was noted in Peace Dale, Washington County, on July 16. Fall webworm was more common on trees and shrubs in OHIO and was unusually heavy on shade and ornamental trees throughout INDIANA during 1964. Nests of this pest were common throughout ILLINOIS and abundant in some localities. In MISSOURI, the highest fall webworm populations were found in the south central and southwestern sections of the State. Heaviest damage in Missouri this season was inflicted on persimmon, but much webbing and defoliation occurred on black walnut and hickory. Fall webworm occurred in isolated local infestations in KANSAS during the 1964 season, with some infestations being severe.

Fall webworm damaged shade and ornamental trees in ALABAMA during 1964. Infestations of this arctiid were not as abundant in LOUISIANA as they were in 1963, although moderate to heavy infestations occurred in several areas on pecan and sweetgum in spite of heavy pressure from biological control agents. Fall webworm appeared early in the season in ARKANSAS and populations were heavy until the occurrence of above-normal rainfall in August. Fall webworm damaged shade trees and ornamentals and caused general concern in one or more areas of TEXAS during 1964. Damage by fall webworm was evident in most areas of NEW MEXICO during the year. Populations were not as heavy during the summer of 1964 as they have been during the past four years in New Mexico, except where heavy populations defoliated poplar, fruitless mulberry and pecan trees in southern Dona Ana County. Fall webworm has all but vanished from western WASHINGTON since 1963.

The FALL CANKERWORM (Alsophila pometaria) population was moderate and caused light damage to elms in an area north of Old Town, Hancock County, MAINE. Only pupae could be found in this area by July 6. In RHODE ISLAND, localized concentrations of unspecified CANKERWORMS were reported from Lincoln and Smithfield in Providence County. Populations of these pests of shade trees were very heavy the previous two years in Cranston, Providence County, and in Wakefield, Washington County, but populations declined in 1964. Cankerworms were also much less abundant in CONNECTICUT in 1964 than they were in 1963. Fall cankerworm and SPRING CANKERWORM (Paleacrita vernata) were not as abundant in the southeastern section of Long Island, NEW YORK, where they have been severe for the past several years. Both species caused extensive defoliation of shade trees in several communities in Erie County this season. Larvae of fall cankerworm and spring cankerworm were numerous in several areas in Lower MICHIGAN in late May, and undetermined cankerworms injured shade trees and shrubbery in Muskegon and Iron Counties in mid-June.

Spring cankerworm damaged shade and ornamental trees, as well as forest trees, in MISSOURI during 1964, and occurred in small, local infestations which were sometimes severe in KANSAS. Unspecified cankerworms were very abundant on various shade trees and shrubs in eastern NORTH DAKOTA this season, with fall cankerworm being the dominant species. Fall cankerworm was quite heavy on alder trees in a few locations in CALIFORNIA.

LINDEN LOOPER (Erannis tiliaria) was not abundant in the southeastern section of NEW YORK during 1964, where it has been severe for the past several years. In the western section of the State, however, linden looper caused extensive defoliation in several Erie County communities.

In western NEW YORK, a combination of spring cankerworm, fall cankerworm and linden looper caused complete defoliation of large acreages of maple orchards, including seedling growth.

TENT CATERPILLARS were of some concern in various States during the 1964 season. EASTERN TENT CATERPILLAR (Malacosoma americanum) eggs began hatching between April 29 and May 2 in the Augusta area of Kennebec County and the Starks area of Sommerset County, MAINE, with tents being noticeable by May 6. Light infestations of this pest caused light damage to ornamental apple and wild cherry between Jonesboro and Cherryfield, Washington County, with a similar degree of activity reported from Androscoggin and Sagadahoc Counties, Maine. Heavy larval infestations of this lasiocampid moth occurred statewide on wild cherry in VERMONT and larvae, seeking resting places, were annoying to householders. Eastern tent caterpillar egg hatch was observed April 20 in Lincoln, Providence County, RHODE ISLAND. Localized, heavy concentrations of this pest were heaviest in the northern part of the State as usual. Eastern tent caterpillar was very light in NEW YORK during 1964, and some infestations on shade trees were reported in VIRGINIA. This shade tree pest was also reported infesting wild cherry in many counties throughout Virginia this season. Eastern tent caterpillar damaged shade and ornamental trees in ALABAMA during the 1964 season, and was general and abundant on wild cherry in GEORGIA, where it moved from this host to roses during the season.

Eastern tent caterpillar was extremely abundant in southwestern INDIANA during the spring. After defoliation of host trees, populations moved in "armies" to new food sources. Eggs of this lasiocampid moth began hatching in the southern third of ILLINOIS April 7-8. Populations were widely distributed over that State during 1964, with very heavy infestations occurring in some areas. In MISSOURI, this pest damaged shade trees and ornamentals, as well as forest trees. Small, local infestations of eastern tent caterpillar occurred in KANSAS during the 1964 season, some of these infestations being severe at times.

FOREST TENT CATERPILLAR (*Malacosoma disstria*) egg hatch was underway in MAINE by May 13 in the Caribou area of Aroostook County. Severe defoliation of poplar occurred in this region by early summer. Defoliation was particularly heavy in Caribou and Presque Isle, Aroostook County, and in the Grand Lake area of Piscataquis County. Although forest tent caterpillar was less abundant in commercial hardwood forests of LOUISIANA in 1964, it was a serious problem on shade trees in the areas of Baton Rouge, New Orleans and Opelousas. Forest tent caterpillar and *M. tigris* caused moderate to severe damage to oaks in central TEXAS during the 1964 season, with the general infestations of these two pests appearing to be more damaging than in 1963. Forest tent caterpillar and GREAT BASIN TENT CATERPILLAR (*M. fragile*) were pests of deciduous shade trees in COLORADO during 1964.

TENT CATERPILLARS (*Malacosoma* spp.) damaged oaks and other ornamentals as well as native shrubs, in CALIFORNIA during the 1964 season. *Malacosoma* spp. eggs began hatching about May 3 in San Juan County, WASHINGTON, and infestations became heavy on ornamental and fruit trees and other plants by late May in Clark County.

GREEN-STRIPED MAPLEWORM (*Anisota rubicunda*) occurred in isolated local infestations in KANSAS during the 1964 season, being severe in some instances, and damaged shade and ornamental trees, as well as forest trees, in MISSOURI.

ORANGE-STRIPED OAKWORM (*Anisota senatoria*) caused nearly complete defoliation of lower limbs and tips of higher branches of oaks in area north of Hanover, Jo Daviess County, ILLINOIS, during August and September. In GEORGIA, light to moderate infestations of this pest occurred on oaks and other shade trees in the Atlanta area during the 1964 season. Orange-striped oakworm was not observed and no reports of complaints concerning this pest were made in RHODE ISLAND.

EUROPEAN PINE SHOOT MOTH (*Rhyacionia buoliana*) infestations were average on ornamental plantings and nurseries in RHODE ISLAND, but continued to increase on ornamentals in PENNSYLVANIA during the 1964 season. Larval infestations of this olethreutid moth were widespread in many Lower MICHIGAN Scotch pine plantations. Pupation began the last week of May and adults began emerging the second week of June, as indicated by data taken from plantations in Livingston and Van Buren Counties. The winter survival survey in WISCONSIN showed that 20 percent of European pine shoot moth larvae survived the winter of 1963-1964. Populations were generally low throughout the State during 1964, except at a few isolated locations. Considerable evidence of BOXELDER TWIG BORER (Proteoteras willingana) activity was observed in the Bottineau area of Bottineau County, NORTH DAKOTA during the 1964 season.

VARIABLE OAK LEAF CATERPILLAR (Heterocampa manteo) occurred on oak trees in the northwestern sections of TEXAS, and defoliated oaks throughout the eastern half of OKLAHOMA from mid-September to late October. In KANSAS, variable oak leaf caterpillar and larvae of other notodontid moths, which caused much defoliation in 1963, were present in only a few, small, local infestations in the State during 1964. YELLOW-NECKED CATERPILLAR (Datana ministra) caused noticeable defoliation of many oaks in the central section of ILLINOIS, but did not appear to be so widespread or so abundant as it has been in recent years.

Several other Lepidoptera were of concern on shade trees in the Nation during the 1964 season. SATIN MOTH (Stilpnotia salicis) caused moderate damage to Carolina poplar in many localities of MAINE during late May, with light damage being reported in South Portland, Cumberland County. Satin moth damaged poplar and willow trees in Siskiyou and Modoc Counties, CALIFORNIA. SADDLEBACK CATERPILLAR (Sibine stimulea) fed on maples in north Kingston, Washington County, RHODE ISLAND, September 2. BUCK MOTH (Hemileuca maia) populations were much reduced in LOUISIANA from those present during recent years, but the light populations present during 1964 were annoying in the areas of Baton Rouge, New Orleans and Opelousas.

OAK SKELETONIZER (Bucculatrix ainsliella) skeletonized leaves on a few oak trees in the central section of ILLINOIS during July, and larval infestations of AMERICAN DAGGER MOTH (Acronicta americana) on boxelder were heavy but spotted in southern Washoe County, NEVADA, during late July and into September. UGLY-NEST CATERPILLAR (Archips cerasivoranus) infested deciduous shade trees in COLORADO during the 1964 season.

MOURNING-CLOAK BUTTERFLY (Nymphalis antiopa) larvae were present on deciduous shade trees in COLORADO, and generally caused light to medium damage to elms in several areas of NEBRASKA. Scattered larval infestations of this nymphalid butterfly occurred on elm and willow in eastern areas of NORTH DAKOTA. Larvae of mourning-cloak butterfly were heavy on a few poplars in the Blue Hill area of Hancock County, MAINE, in early July.

ELM LEAF BEETLE (Galerucella xanthomelaena) was severe in all stages on elm in Grant County, WASHINGTON, in late June, with skeletonizing of leaves being severe by mid-July. This leaf beetle was a problem in many areas of CALIFORNIA, requiring considerable control on elms, which are important shade trees in the State. The new infestations of this chrysomelid beetle found in ARIZONA during 1964 appear to indicate a very rapid and widespread dispersal of this insect there. Old, established infestations increased in size and severe damage occurred on trees in many areas. This beetle is rapidly becoming a problem to homeowners in Arizona. During the summer and fall, light to heavy populations of elm leaf beetle were found defoliating Chinese elm trees in Rio Arriba, Santa Fe, Bernalillo, Valencia, Sandoval and Quay Counties, NEW MEXICO. This leaf beetle severely damaged or defoliated elms in all areas of the Arkansas River Valley section of COLORADO and has become established in all communities in the western part of the State where high numbers were observed in most areas and most communities conducted spray programs.

Elm leaf beetle populations and damage were medium to heavy in the infested areas of NEBRASKA, and the pest was reported from 8 new counties in KANSAS during the 1964 season. Reports of severe defoliation by second, third and fourth generations were more numerous than in previous years. This leaf beetle is rapidly becoming the most serious pest of shade trees in Kansas. This leaf-feeding beetle caused light to heavy damage over MISSOURI during the season, especially in metropolitan areas. Elm leaf beetle caused severe browning of Chinese elm leaves in southern ILLINOIS by July 1, and many severely browned Chinese elms were observed in the central section of the State August 3-6.

At this time, larvae were rapidly reaching full development with many pupae being observed around bases of trees. A few elm leaf beetle adults were also observed.

Elm leaf beetle caused serious damage throughout most areas of OKLAHOMA for the seventh consecutive year. Adults began to move from hibernation quarters in early April, egg laying began in late April and activity of this pest continued in the State until early October. This leaf beetle caused considerable damage to elms in the north and northwestern areas of TEXAS, and is apparently on the increase in the State. Elm leaf beetle was heavier and more widespread in ARKANSAS during 1964 than at any time in the past. Adults were very active and severe feeding occurred in the northwestern sections of the State by late April. The first seasonal emergence record in Arkansas in 1964 was in early April. This chrysomelid beetle damaged shade and ornamental trees in ALABAMA. Infestations in GEORGIA were general and populations were moderate to heavy.

Elm leaf beetle populations ranged medium to heavy on elms in various sections of VIRGINIA and were unusually abundant in all sections of MARYLAND where they caused considerable damage to American elms. This pest of shade trees was moderate to heavy across NEW YORK during the 1964 season, and was general in RHODE ISLAND, with isolated variation in abundance. This beetle was perhaps a little less noticeable in Rhode Island this season than it was in 1963. Elm leaf beetle was also noticeably less numerous during 1964 than during 1963 in the southern and central sections of MAINE. Light to moderate infestations were reported from Augusta, Kennebec County; Bridgton, Cumberland County; and Richmond, Sagadahoc County, on July 20. This species was mostly in the pupal stage in Maine on that date.

LARGER ELM LEAF BEETLE (*Monocesta coryli*) was reported to be more extensive and severe in the Piedmont region of NORTH CAROLINA than in previous years. The first adults of the 1964 season in North Carolina were taken on June 9 in Guilford County. Moderate to heavy infestations of larger elm leaf beetle occurred on elms at a few locations in GEORGIA this year.

LOCUST LEAF MINER (*Xenochalepus dorsalis*) was reported from Washington, Hardin and Pike Counties, ILLINOIS, for the first time during the 1964 season. This pest was not evident in RHODE ISLAND, however. A LEAF BEETLE (*Plagiomorpha arizonae*) severely damaged willow trees and shrubs at Veyo, Washington County, UTAH, on June 9, with one species of willow being more severely damaged than other species. Determination of this leaf beetle was made by G. B. Vogt.

SMALLER EUROPEAN ELM BARK BEETLE (*Scolytus multistriatus*) was found on elms over a wide area in the northern and northwestern sections of TEXAS and was active in OKLAHOMA during the 1964 season. Light infestations were found for the first time in Lyon and Pershing Counties, NEVADA. This vector of Dutch elm disease is now found in almost all counties in the southeastern quarter of MINNESOTA. The disease is found in the Monticello area of Wright County and in the Minneapolis-St. Paul area of the State, and showed a nominal increase during the 1964 season.

TWIG PRUNER (*Elaphidion villosum*) ranged light to moderate in numbers and caused light damage to oaks and some maples in the southern section of MAINE in mid-July. This cerambycid beetle was generally noticeable along roadsides throughout RHODE ISLAND, although it was perhaps a little less conspicuous this year than in previous years. Infestations of TWIG GIRDLER (*Oncideres cingulata*) were considered to be about average in ARKANSAS during 1964, and the pest severed branches from elm trees at various locations in eastern KANSAS. Adults of GREEN JUNE BEETLE (*Cotinis nitida*) were reported as heavy on some maple trees in the extreme southern section of ILLINOIS during late June and early July. BRONZE BIRCH BORER (*Agrilus anxius*) was present in all urban areas of MINNESOTA, where European white birch and native birch were most susceptible. A number of fields of native and nursery grown birch were refused certification because of the presence of this buprestid beetle. POPLAR-AND-WILLOW BORER (*Sternochetus lapathi*) was active on young poplar in a nursery at Oakes, Dickey County, NORTH DAKOTA. RED ELM BARK WEEVIL (Magdalis armicollis) infested deciduous shade trees in COLORADO during the 1964 season.

OYSTERSHELL SCALE (Lepidosaphes ulmi) infestations ranged moderate to heavy on willow and other shade trees at Santa Fe, Santa Fe County, NEW MEXICO, and the pest was present on deciduous trees and ornamental shrubs in COLORADO. Infestations remained approximately the same in WYOMING as they were in 1963. A few new infestations of oystershell scale were noted, with severe damage inflicted to some elm and ash trees and lilac bushes throughout the State. Control measures, where properly timed and applied, were generally effective. Many inquiries concerning oystershell scale were made in VIRGINIA during the 1964 season, and some heavy infestations were noted on elms in New Castle County, DELAWARE. This armored scale was severe on shade trees in NEW YORK and moderately abundant on ornamental and shade trees in CONNECTICUT.

An ARMORED SCALE (Fiorinia externa) occurred in nurseries and on hemlock in the southeastern area of PENNSYLVANIA. OBSCURE SCALE (Chrysomphalus obscurus) was heavy on large oaks on several properties in Montgomery and Prince Georges Counties, MARYLAND, and GLOOMY SCALE (C. tenebricosus) was severe on several maple trees in one section of VIRGINIA. OLEANDER SCALE (Aspidiotus hederae) was a problem on many shade trees and ornamentals over CALIFORNIA during the 1964 season.

EUROPEAN ELM SCALE (Gossyparia spuria) was a statewide problem on shade trees in CALIFORNIA and light to moderate populations damaged European elm trees in the Albuquerque area of Bernalillo County, NEW MEXICO. Infestations of this dactylopiid scale were approximately the same in WYOMING as they were in 1963. A few new infestations were noted, however, with severe damage occurring on some ash and elm trees and some lilac bushes throughout the State. When properly timed and applied, however, control measures were generally effective. European elm scale infestations were as severe as in the past throughout the western part of KANSAS during the 1964 season. Elm branches containing several thousands of overwintering nymphs were collected from a number of localities in Kansas. Ten individuals of a parasitic EULOPHID (Physcus varicornis) were reared from these collections. An OAK KERMES SCALE (Kermes bougei) was active on oak in OKLAHOMA during the 1964 season.

TULIPTREE SCALE (Toumeyella liriodendri) was not common on shade trees in RHODE ISLAND during 1964, although heavy numbers were noted on several trees in Kenyon, Washington County. Crawlers were active September 28. Increased populations of this soft scale caused considerable concern with respect to shade and ornamental trees again in INDIANA during the summer of the 1964 season. This pest also appears to be moving into the forest areas of the State and may cause some future damage in these areas. Tuliptree scale infested a limited number of tuliptrees in San Jose, Santa Clara County, CALIFORNIA, where an eradicative treatment program is underway.

COTTONY MAPLE SCALE (Pulvinaria innumerabilis) was found to be extremely heavy on silver maples in and near Howard Lake, Wright County, MINNESOTA. Nearby towns also exhibited sharp increases in populations. No heavy infestations of this pest were found in nurseries in the area; however, trace infestations were found in several nurseries in other parts of Minnesota. Cottony maple scale eggs began hatching by June 16 in the southern counties of WISCONSIN. Populations were unusually high this season and elms were being killed in Walworth County. This soft scale was again abundant in northwestern INDIANA during 1964. Populations in the Fowler area of Benton County continued to be severe. For the past several years populations of this pest have been generally low in Indiana, but an apparent buildup in populations is again underway.

EUROPEAN FRUIT LECANIUM (Lecanium corni) was heavy and injured American elms in the Bangor area of Penobscot County, MAINE. This injury in combination with drought conditions contributed to excessive and premature abscission of twigs at the terminal bud scale. Several infestations of CALICO SCALE (Lecanium cerasorum) were noted on maples and sweetgum in northern New Castle County, DELAWARE, and this soft scale was general on liquidamber trees in Marin County, CALIFORNIA. An isolated infestation of TERRAPIN SCALE (L. nigrofasciatum) was noted on elm in the Fargo area of Cass County, NORTH DAKOTA.

SOFT SCALES (Lecanium spp.) were severe on shade trees in NEW YORK, and were again prevalent on oaks in NORTH CAROLINA during April, May and June. Crawlers were present in Duplin County, North Carolina, during the third week of May and in Vance County during the second week of June.

GOLDEN OAK SCALE (Asterolecanium variolosum) infestations were general on oaks in the San Joaquin Valley and a PIT SCALE (A. minus) was heavy on deciduous oaks in Napa County, both in CALIFORNIA. Also in California, a MARGARODID SCALE (Stomacoccus platani) was a general pest of sycamores.

Several other Hemiptera caused some concern during the 1964 season. WOOLLY ALDER APHID (Prociphilus tessellatus) occurred in moderate numbers and caused light damage to silver maple in southern MAINE. This aphid was noted occasionally on soft maple in VERMONT and heavy infestations on stems and twigs of alder occurred at various locations in the State. Woolly alder aphid was often reported infesting maple in NORTH CAROLINA this season during late May through June, especially in the Piedmont area. Infestations of this aphid ranged moderate to heavy on maple in northern GEORGIA as they did in 1963.

WOOLLY ELM APHID (Eriosoma americanum) was quite common in northeastern NORTH DAKOTA, and large populations caused much curling of leaves of American elm trees in WYOMING. The largest infestations in Wyoming were found in the Big Horn Basin area, but smaller infestations were found throughout the State. Control efforts were used in many areas with only a limited degree of success in most instances.

PAINTED MAPLE APHID (Drepanaphis acerifoliae) was heavy on maple during October and early November in southern Washoe County, NEVADA, and was a local problem on maple trees in Fresno and Yuba Counties, CALIFORNIA.

A PERIODICAL CICADA (Magicicada septendecim) damaged shade and ornamental trees in MISSOURI this season. Adults first appeared in KANSAS in timberlands along the Missouri River bluffs north and west of Wathena, Doniphan County, about May 23, and emergence was at a peak by June 3. A number of shade trees were injured by oviposition punctures. In FLORIDA, a LEAFHOPPER (Kunzeana sp.) caused severe yellowing of leaves of Bahama lysiloma (Lysiloma bahamensis) in areas where this species is used as a shade tree. BOXWOOD PSYLLID (Psylla buxi) infested English boxwood in VIRGINIA, and HACKBERRY-NIPPLE-GALL MAKER (Pachypsylla celtidismamma) occurred on deciduous shade trees in COLORADO.

SYCAMORE LACE BUG (Corythucha ciliata) was numerous, as usual, wherever the host tree is commonly grown for shade in KANSAS. Colonies in Ingham County, MICHIGAN, built up and caused discoloration of sycamore leaves in July, with populations persisting into September.

YELLOW-HEADED SPRUCE SAWFLY (Pikonema alaskensis) infested spruce in MAINE at Ellsworth, Hancock County, in early July and occasionally defoliated ornamental spruce. MAPLE PETIOLE BORER (Caulocampus acericaulis) populations in CONNECTICUT during 1964 were down from the 1963 levels. ELM LEAF MINER (Fenusa ulmi) infestations were local but widely scattered in NEW YORK, ELM SAWFLY (Cimbex americana) was moderate on elm in some southern areas of NORTH DAKOTA this season, BROWN-HEADED ASH SAWFLY (Tomostethus multicinctus) required controls on ash trees in Tehama County, CALIFORNIA.

Various GALL WASPS caused distortion of leaves and defoliation of oaks in southeastern sections of KANSAS during the 1964 season. During the past two or three years, very severe infestations of a GALL WASP (Plagiotrichus punctatus) have occurred on large oak trees in DELAWARE, and this was again the situation in 1964.

MAPLE BLADDER-GALL MITE (Vasates quadripedes) resulted in numerous complaints by homeowners in RHODE ISLAND. This probably reflects increased popularity of host plants. This eriophyid mite was also numerous in CONNECTICUT during the 1964 season.

ORNAMENTAL INSECTS

Highlights:

BAGWORM was severe in Georgia, Oklahoma, Kansas, Illinois and Maryland, was heavier than usual in Arkansas, and was recorded for the first time in Ormsby County, Nevada. A GERANIUM PLUME MOTH (Platyptilia pica) caused serious damage to geraniums in Ohio and was serious on this host in California. MIMOSA WEBWORM caused serious damage in New Jersey, Maryland, Illinois and Missouri, was heavier than usual in Arkansas and spread in Ohio and Illinois. Several WEEVILS caused varying degrees of concern over the Nation during the 1964 season, and ROSE CHAFER occurred in damaging numbers in several areas of New England. APHIDS caused considerable concern on ornamentals throughout the Nation, and numerous SCALE INSECTS and a few MEALYBUGS were damaging to ornamentals as well. SPIDER MITES were of considerable concern in various areas of the Country and ERIOPHYID MITES were damaging in a few locations this season.

BAGWORM (Thyridopteryx ephemeraeformis) infestations were very severe on ornamental arborvitae, juniper and cedar in GEORGIA. Populations were heavier than usual during 1964 in ARKANSAS, with some damage noted to deciduous ornamentals. Infestations of bagworm were present in the usual degree of severity in most areas of TEXAS, and heavy populations caused considerable damage to ornamental evergreens throughout OKLAHOMA from mid-May through early September. Severe outbreaks of this psychid moth continued to occur in nurseries and shelterbelts in eastern and south central KANSAS during July and August. Bagworm was recorded for the first time in Ormsby County, NEVADA, in 1964.

Bagworm caused scattered heavy damage in the eastern portion of MISSOURI on ornamental as well as native trees. Severe damage to some ornamental evergreens by this pest occurred in the southern half of ILLINOIS and heavy feeding on some ornamental evergreen, sycamore and maple trees in the central sections of the State was observed in early August. Bagworm infested ornamental shrubbery in VIRGINIA and caused serious damage to arborvitae and junipers on several occasions in MARYLAND. Bagworm infested several acres of Scotch pine Christmas trees in Snyder County, PENNSYLVANIA, with damage observed on numerous trees.

SPRUCE NEEDLE MINER (Taniva albolineana) infestations ranged moderate to heavy on ornamental spruces in Benton County, WASHINGTON, during the late spring and in Whitman County in early summer. Spruce needle miner infested ornamental coniferous trees in COLORADO and was common on ornamental spruce in southern NORTH DAKOTA during the 1964 season. In RHODE ISLAND, ornamental spruce was damaged by larvae of this olethreutid moth in Middletown, Newport County, in mid-June.

JUNIPER WEBWORM (Dichomeris marginella) larvae damaged ornamental junipers in New Castle County, DELAWARE, during mid-May and infested evergreen shrubbery in VIRGINIA during the season. A JUNIPER TWIG MOTH (Periploca nigra) was serious on ornamental junipers in CALIFORNIA.

AZALEA CATERPILLAR (Datana major) appeared suddenly on some plantings of azaleas in the Gainesville area of Alachua County, FLORIDA, during the summer of 1964. These infestations were spotty, but often resulted in the defoliation of individual plants. Larval infestations of this notodontid moth were general and especially heavy in southern GEORGIA and damaged ornamental shrubs along coastal areas of ALABAMA.

HAG MOTH (Phobetron pithecium) was observed feeding on ornamental shrubbery in Westerly in early August and a PLUTELLID MOTH (Argyresthia sp.) was locally heavy on arborvitae in Wakefield, both in Washington County, RHODE ISLAND. AMERICAN PLUM BORER (Euzophera semifuneralis) was troublesome on London planetrees on Long Island, NEW YORK. LILAC LEAF MINER (Gracilaria syringella) was collected for the first time in Vilas and Oneida Counties, WISCONSIN, during the 1964 season. A GERANIUM PLUME MOTH (Platyptilia pica) is now known to occur in 6 counties in OHIO. During 1964 this pest caused severe damage to thousands of geranium plants in the northeastern part of the Buckeye State. This plume moth was also a serious pest of geraniums in CALIFORNIA this season. Larvae of WESTERN TUSSOCK MOTH (Hemerocampa vetusta) began appearing during mid-May in NEVADA. Peak populations, which were the heaviest observed in several years, occurred in late June and early July in Ormsby and Washoe Counties. Damage to bitterbrush, desert peach, serviceberry, wild rose and willow was severe and some damage to ornamental Prunus spp. and roses also occurred. In one area of Washoe County, Nevada, a virus killed many of the larvae, but not soon enough to prevent heavy damage to ornamentals.

FLORIDA FERN CATERPILLAR (Callopistria floridensis) occurred in fairly heavy outbreak numbers on leatherleaf fern (Polystichum adiantiforme) during the autumn of 1964 in the Bradenton area of Manatee County, FLORIDA. In this same area of Florida, BEET ARMYWORM (Spodoptera exigua) was severe on gladiolus and pompons during the season, and most prevalent on potted chrysanthemums. CORN EARWORM (Heliothis zea) was often injurious to roses in ALABAMA. TOBACCO BUDWORM (H. virescens) infested petunias in Lubbock County, TEXAS, and damaged geraniums in many locations of CALIFORNIA this past season. STALK BORER (Papaipema nebris) was a serious pest of dahlias in ALABAMA and COLUMBINE BORER (P. purpurifascia) caused considerable damage to columbine in southeastern NORTH DAKOTA. RED-BACKED CUTWORM (Euxoa ochrogaster) and several other CUTWORMS damaged many flower gardens in ALASKA for the first time in several years.

ORANGE TORTRIX (Argyrotaenia citrina) heavily infested greenhouse-grown flowering and foliage plants in the Puyallup Valley of WASHINGTON during the spring and fall. In CALIFORNIA, this pest riddled the terminals of ornamental Japanese black pine at Camarillo in Ventura County, camellia buds in Santa Barbara County and Bauhinia plants in San Diego County. FRUIT-TREE LEAF ROLLER (Archips argyrospilus) infested deciduous ornamental trees and shrubs in COLORADO. In Washoe County, NEVADA, larvae of a LEAF ROLLER MOTH (Choristoneura zapulata) caused medium to heavy damage to various ornamental shrubs in late May and June.

Migrating populations of WHITE-LINED SPHINX (Celerio lineata) larvae caused heavy damage to ornamentals in much of the southern half of ARIZONA, and CATALPA SPHINX (Ceratomia catalpae) damaged ornamentals as well as shade and forest trees in MISSOURI.

DOGWOOD BORER (Thamnosphecia scitula) infestations were rather common in dogwood in New Castle County, DELAWARE, and the pest infested this host in VIRGINIA. Populations of LILAC BORER (Podosesia syringae syringae) were higher in CONNECTICUT during 1964 than they were in 1963, and a moderate larval infestation of this clearwing moth was observed in a nursery in NORTH DAKOTA at Valley City, Barnes County.

MIMOSA WEBWORM (Homadaula albizziae) infestations were moderate to high in southern counties of NEW JERSEY during the 1964 season. Populations of this pest were heavy in MARYLAND and conspicuously damaged mimosa and honeylocust in southern areas of that State. Mimosa webworm is now known to occur in 28 counties of OHIO, and the range of this species was extended in ILLINOIS during the season with 12 new county records being reported. Leaves of many mimosa and honeylocust trees were completely browned and killed in the southern section. Honeylocust was also severely browned in the central section of Illinois this season. Mimosa webworm damaged ornamental, shade and other trees in MISSOURI and was heavier than normal in ARKANSAS. Mimosa webworm also damaged ornamental and shade trees in ALABAMA. Mimosa webworm is under control treatment in Chico, Butte County, CALIFORNIA, the only location this species is known to occur in that west coast State.

SOD WEBWORMS occurred in high populations in southern counties of NEW JERSEY throughout the 1964 season. In central and northern counties, there appeared to be a heavy early population of these pests which diminished through the summer months.

BLACK VINE WEEVIL (Brachyrhinus sulcatus) larvae were abundant in yew plantings at Middleton in Newport County, RHODE ISLAND, and first adults of the season were collected May 20 in Lincoln, Providence County. This weevil was especially numerous during the 1964 season throughout NEW YORK. Populations of this curculionid in Lake County, INDIANA, were the heaviest in recent years, with many nursery and ornamental plantings being heavily damaged and many yew plants being killed by larval feeding. Economic injury also increased during 1964 in the metropolitan area of Indianapolis, Marion County. Black vine weevil was recorded for the first time in WISCONSIN during 1964 when specimens were collected in Jefferson County.

STRAWBERRY ROOT WEEVIL (Brachyrhinus ovatus) caused "flagging" of arborvitae at several locations in MINNESOTA and was especially numerous throughout NEW YORK during the season.

Several other WEEVILS were of some concern in various areas of the Nation during the 1964 season. Populations of Pissodes approximatus are increasing on Christmas tree plantations in NEW YORK, particularly on Scotch pine, due to selective cutting practices. Serious browning of lateral branches on marketable healthy trees is prevalent in most established plantations in New York. Adults of Pseudocneorhinus bifasciatus (a Japanese weevil) were rather abundant in DELAWARE during early July, feeding on the foliage of several ornamentals, especially lilac and forsythia. Adults of Brachyrhinus spp. caused medium to heavy damage to lilac and privet foliage in Douglas and Washoe Counties, NEVADA, during August and September. Nemocestes incomptus and Brachyrhinus singularis damaged primroses in King County, WASHINGTON, during early fall and Nemocestes sp. damaged a home garden near Seattle. N. incomptus also caused the loss of 5,000 rhododendron plants in Pacific County, Washington. HOLLYHOCK WEEVIL (Apion longirostre) infested hollyhock in a few locations in the northern section of CALIFORNIA, and A. fuscirostre was heavy in Scotch broom seed pods in El Dorado and Nevada Counties.

ROSE CURCULIO (Rhynchites bicolor) was observed on rose in Warwick, Kent County, RHODE ISLAND, in late June. This curculionid caused heavy damage to roses in the Esmond area of Benson County, NORTH DAKOTA, and infested ornamental shrubs in COLORADO. Heavy larval infestations of a BILLBUG (Sphenophorus phoeniciensis) caused spotted damage to ornamentals in central and western sections of ARIZONA during the late spring of 1964.

ROSE CHAFER (Macrodactylus subspinosus) was heavy and damaged roses, geraniums and other plants in Portland and South Portland, Cumberland County, MAINE, this season. Light infestations and damage were general in Androscoggin and Sagadahoc Counties, Maine. Heavy populations of this scarab occurred in many areas of VERMONT in 1964 on a wide variety of ornamental trees and plants. Outbreak numbers of rose chafer occurred on ornamentals in some areas of Plymouth County, MASSACHUSETTS Populations in CONNECTICUT were about the same as they were in 1963. Adult numbers of this chafer were lower than usual in most areas of MICHIGAN. Adult emergence peaked in central and southern counties of Lower Michigan during the second week of June. In WISCONSIN, rose chafer was reported to have caused considerable damage to a wide variety of ornamentals throughout the central section of the State.

A CUBAN MAY BEETLE (Phyllophaga bruneri) definitely became more of a pest of woody ornamentals and some flowers and fruit trees in the Miami area of Dade County, FLORIDA, the only known infested area in the United States. This May beetle is now known to have 65 host plants. The area of infestation increased to north of Hialeah and Opa Locka extending to Miami Gardens Drive; this is a spread of approximately three miles. On the south, infestation increased along a peripheral zone from the downtown area on the east to 0.5 mile west of the Tamiami Airport on the west. Much of the eastern and southeastern area of infestation extends to Biscayne Bay. The average extension of infestation along the southern border was approximately one mile during 1964. Phyllophaga spp. damaged ornamentals and caused general concern in one or more areas of TEXAS during the 1964 season.

A SCARAB (Pelidnota punctata) was collected in a field at Rumford in Providence County and in a blacklight trap at Kingston in Washington County, RHODE ISLAND, in mid-August. This species appears to be more common in the State than it has been for nearly a decade. Other SCARABS (Hoplia spp.) were very prevalent on roses and some garden plants in the northern section of CALIFORNIA in the spring.

IMPORTED WILLOW LEAF BEETLE (Plagiodera versicolora) was present statewide in RHODE ISLAND in perennial abundance from early May into late summer. DOGWOOD TWIG BORER (Oberea tripunctata) infested dogwood in VIRGINIA and ASH-GRAY BLISTER BEETLE (Epicauta fabricii) was moderately abundant on caragana in NORTH DAKOTA.

APHIDS were of considerable concern on ornamentals throughout the Nation during the 1964 season. BEAN APHID (Aphis fabae) was heavy on euonymus in the Peace Dale area of Washington County, RHODE ISLAND, in early May and a concentration of SPIREA APHID (A. spiraecola) was observed in Kingston on June 9. COTTON APHID (A. gossypii) was injurious to althaea at several locations in Prince Georges County, MARYLAND. OLEANDER APHID (A. nerii) was much less troublesome in Washington County, UTAH, in 1964 than during the past several years. SPRUCE APHID (A. abietina) caused severe damage to ornamental spruce during early spring in Clark County, WASHINGTON.

POTATO APHID (Macrosiphum euphorbiae) infested roses in RHODE ISLAND, and infestations of CHRYSANTHEMUM APHID (Macrosiphoniella sanborni) were rather heavy on chrysanthemums during early May and again in mid-August in most areas of DELAWARE. ROSE APHID (Macrosiphum rosae) infested roses in many areas of MARYLAND, was more common than usual in OHIO and occurred on roses in CALIFORNIA in usual spring populations. PEA APHID (Acyrthosiphon pisum) lightly infested field grown iris in WASHINGTON and CRESCENT-MARKED LILY APHID (Neomyzus circumflexus) heavily infested Gaultheria procumbens in greenhouse flats in Pierce County, WASHINGTON. WOOLLY APPLE APHID (Eriosoma lanigerum) caused considerable damage to pyracantha, resulting in an unsightly appearance, in CALIFORNIA. Heavy populations of woolly apple aphid were destructive to many ornamentals during late summer and fall in many areas of ARIZONA, and caused extreme rosetting on terminal foliage of twigs on ornamental elms in several eastern areas of NORTH DAKOTA.

APHIDS were generally more abundant than normal throughout NEW HAMPSHIRE during the 1964 season and were particularly troublesome on ornamentals where sooty fungus, developing on honeydew, created problems. Various species resulted in numerous complaints in RHODE ISLAND, mostly because of honeydew and sooty mold on ornamental maples and lindens. Lachnus salignus was abundant in all parts of Rhode Island on ornamental weeping willow and was often noted climbing on buildings. Chermes spp. were becoming increasingly troublesome on ornamental conifers in NEW YORK, and Eulachnus rileyi was moderately abundant and widespread on developing shoots of Scotch pine in the State during 1964. Various aphids were generally heavy on many ornamentals and shade trees in NEW JERSEY, were very much in evidence on ornamentals and garden flowers in PENNSYLVANIA, and were unusually heavy on such ornamentals as crapemyrtle, spirea and roses in certain sections of VIRGINIA.

Aphids were very damaging to ornamental shrubs and roses in ALABAMA and several species damaged ornamentals and caused general concern in one or more areas of TEXAS during the past season. Drepanaphis sp. was heavy on ornamental red maple during October in northwest ARKANSAS. Several species of aphids were active on ornamentals in OKLAHOMA during the 1964 season and infested ornamentals and shade trees in varying degrees generally throughout NEVADA. Cinara sp. was heavy on ornamental pinyon pine in Esmeralda County, Nevada, in October.

Populations of Chaitophorus populellus were slightly lower in WYOMING during 1964 than they were in 1963. Honeydew produced by this species caused much concern to owners of homes and automobiles throughout the State this season. Large populations of Monellia caryae occurred on ornamental pecan trees in the Torrington area of Goshen County, Wyoming, but most complaints were in regard to large amounts of honeydew present on leaves and on lawns under these trees. Controls, when properly applied, were very effective. Various species of aphids infested ornamental shrubs in COLORADO. Populations of Cinara tujafilina were reported to be lighter than usual in most areas of NEW MEXICO this past season; however, populations built up to heavy proportions on arborvitae in San Juan County during the fall months. Undetermined aphids were very abundant in CALIFORNIA in the spring, with some populations persisting late into the season. Prociphilus sp. was locally damaging ash trees in San Joaquin County. P. fraxinifolii was heavy on ash trees in a few locations in the State, and Vesiculaphis caricis occurred locally on azaleas in Calaveras, Fresno and Stanislaus Counties. Lachnus salignus was severe on ornamental and native willows this season. Neophyllaphis podocarpi infested Podocarpus spp. in San Mateo, Santa Cruz and Orange Counties, California. C. tujafilina was abundant in Yakima County, WASHINGTON, late in the spring of 1964.

EASTERN SPRUCE GALL APHID (Chermes abietis) overwintering forms were very abundant on spruce in southern MAINE on April 1, and moderate to heavy populations damaged ornamental spruce in June. Eastern spruce gall aphid was average in abundance on ornamental spruce throughout RHODE ISLAND and the abundance of this aphid has been increasing in CONNECTICUT for the past three years. Eastern spruce gall aphid frequently infested ornamental spruce in ALASKA during 1964.

COOLEY SPRUCE GALL APHID (Chermes cooleyi) was present in about average numbers on ornamental spruce throughout RHODE ISLAND during the past season and was again present in increasingly abundant numbers in CONNECTICUT as it has been for the past three years.

PINE NEEDLE SCALE (Phenacaspis pinifoliae) was present in light to moderate numbers on ornamental pines in Potter and Randall Counties, TEXAS, and occurred on ornamental conifers in COLORADO. Infestations of pine needle scale in WYOMING during 1964 were approximately the same as in 1963. A few new infestations were noted over the State. Control measures, when properly timed and applied, were generally effective in Wyoming this past season. Pine needle scale required treatment in a few locations in MINNESOTA. Populations were heavy in ILLINOIS, where egg hatch was noted on Mugho pines in Champaign County May 11-14. In INDIANA, this species has begun to appear in pine plantations throughout the State. Thus far, however, only a few individual trees are heavily infested, but this could be an explosive situation.

Pine needle scale was of some concern on ornamental pines in VIRGINIA during 1964 and infested ornamental white pines at several locations in Prince Georges County, MARYLAND. Pine needle scale was severe on ornamentals in NEW YORK during 1964, being a major problem on Scotch pine. This pest is becoming more serious on Christmas tree plantations in New York, especially on the borders of Lake Ontario in the central part of the State. Pine needle scale egg hatch occurred in the Kingston area of Washington County and the Warwick area of Kent County, RHODE ISLAND, on June 22 and 29, respectively.

EUONYMUS SCALE (Unaspis euonymi) was serious in NEW YORK during the past season, and populations were up in CONNECTICUT. Euonymus scale was rather common on euonymus in most areas of DELAWARE, was frequently a problem on euonymus and bittersweet throughout MARYLAND, and was heavy on euonymus in certain areas of VIRGINIA. This armored scale was also a serious problem on euonymus in NORTH CAROLINA. Crawlers of this pest were active during early July in Ingham County, MICHIGAN. Euonymus scale was more common during 1964 in OHIO than during 1963. Damage by this armored scale in OKLAHOMA was lighter than usual, but damage to ornamentals was of general concern in one or more areas of TEXAS. Euonymus scale was a serious problem on euonymus in Bernalillo County, NEW MEXICO, where it was difficult to control.

OBSCURE SCALE (Chrysomphalus obscurus) was heavy in Union and Morris Counties, NEW JERSEY. SAN JOSE SCALE (Aspidiotus perniciosus) caused considerable local injury to pyracantha and Prunus spp. in MARYLAND, was of some concern in VIRGINIA, and damaged pyracantha plantings in the Lafayette area of Tippecanoe County, INDIANA. WHITE PEACH SCALE (Pseudaulacaspis pentagona) was of some concern in VIRGINIA during the 1964 season, and damaged ornamentals in one or more areas of TEXAS, where it caused general concern. TEA SCALE (Fiorinia theae) was heavy in the Atlanta area of GEORGIA and was slightly heavier than usual on ornamentals in northeastern FLORIDA. FLORIDA RED SCALE (Chrysomphalus aonidum) was not as numerous, or at least not as damaging, to ornamentals as usual in Florida. Tea scale caused severe damage to camellias throughout LOUISIANA, where CAMELLIA SCALE (Lepidosaphes camelliae) was a serious problem on some varieties of this host in Washington, St. Tammany and East Baton Rouge Parishes.

Other ARMORED SCALES that were of concern during 1964 included Lepidosaphes yanagicola on Euonymus alatus in PENNSYLVANIA, Aspidiotus osborni on ornamentals in VIRGINIA, and Diaspis boisduvalii which was of considerable concern on cymbidiums in coastal areas of Santa Barbara County, CALIFORNIA.

FLETCHER SCALE (Lecanium fletcheri) was severe on arborvitae at Mandan, Morton County, NORTH DAKOTA, but populations were generally low in MINNESOTA, although sharp increases were noted in several local areas in Minnesota. Eggs of Fletcher scale hatched by June 15 in Jefferson County, WISCONSIN. This soft scale was general, but apparently not a major problem in RHODE ISLAND, where nurserymen apparently have this stubborn problem under control.

FLORIDA WAX SCALE (Ceroplastes floridensis) was widespread and created a major problem on ornamentals on the Eastern Shore of VIRGINIA during the 1964 season. This pest was slightly heavier than usual on ornamentals in northeastern FLORIDA, and infested Ilex spp. in the Baton Rouge and New Orleans areas of LOUISIANA. WAX SCALES (Ceroplastes spp.) were common problems on various ornamentals in NORTH CAROLINA and were of some concern in VIRGINIA.

MAGNOLIA SCALE (Neolecanium cornuparvum) was more common than usual on ornamental trees and shrubs in OHIO, and was severe on ornamentals in NEW YORK. Infestations were rather common on magnolia in DELAWARE during 1964, with young crawlers noted on August 31.

AZALEA BARK SCALE (Eriococcus azaleae) was severe on some varieties of azaleas in Washington Parish, LOUISIANA, and COTTONY-CUSHION SCALE (Icerya purchasi) damaged ornamentals and was of concern in one or more areas of TEXAS. RED-PINE SCALE (Matsucoccus resinosae), previously known only on red pine, was found infesting Japanese black pine in Nassau County on Long Island, NEW YORK, during 1964. In NEW JERSEY, infestations of GOLDEN OAK SCALE (Asterolecanium variolosum) were heavy on ornamentals in Union and Morris Counties.

GRAPE MEALYBUG (Pseudococcus maritimus) continued to be a problem on yew in PENNSYLVANIA, especially in nurseries, during the 1964 season. CITRUS MEALYBUG (P. citri) infestations were heavy on dieffenbachia in one section of VIRGINIA and on unspecified house plants in another part of the State, and LONG-TAILED MEALYBUG (P. adonidum) infested holly in local areas of Tarrant County, TEXAS.

MEALYBUGS were prevalent and damaging in CALIFORNIA during the 1964 season. MEXICAN MEALYBUG (Phenacoccus gossypii) was widespread on ornamentals in the State and infestations of Pseudococcus microcirculus were present in a few orchid houses in the northern section of the State. Many species of mealybugs infested and damaged ornamentals in ALABAMA during the past season. Eggs of unspecified mealybugs began hatching in WISCONSIN by mid-June and these pests were found on hawthorns brought from out of the State. Considerable predation of mealybugs by larvae of Adalia bipunctata (two-spotted lady beetle) was noted on one infestation. By October 28, a general migration of mealybugs towards central parts of plants was noted in Wisconsin. Pseudococcus cuspidatae was especially numerous on ornamentals throughout NEW YORK during the 1964 season.

AZALEA WHITEFLY (Pealius azaleae) populations were high, as usual, on Rhododendron mucronatum wherever it is grown in RHODE ISLAND. Another WHITEFLY (Aleurotuberculatus similis), determined by L. M. Russell, was very heavy and damaging on Japanese holly (Ilex crenata var. convexa) on several properties in the Kingston area of Washington County, RHODE ISLAND. This constituted a new State record for Rhode Island during the 1964 season. GREENHOUSE WHITEFLY (Trialeurodes vaporariorum) was abundant on geraniums and fuchsias in Pierce County, WASHINGTON. Unspecified whiteflies were damaging ornamental shrubs in ALABAMA

PSYLLIDS were of some concern in CALIFORNIA and TEXAS during 1964. Psylla uncatoides was severe on acacia and albizia statewide in California and Euphyllura arbuti was a serious pest of madrone trees in the northern section of the State. In Texas, Paurocephala ilicis infested youpon in Brazos County.

Several other Homoptera were of concern during the 1964 season. Overwintering populations of POTATO LEAFHOPPER (Empoasca fabae) were common on such hosts as waxmyrtle in the Baton Rouge area of East Baton Rouge Parish, LOUISIANA, during December. Populations of a THORN BUG (Umbonia crassicornis) increased in southern FLORIDA and damaged several ornamental leguminous trees and shrubs. A FLATID PLANTHOPPER (Metcalfa pruinosa) was moderate to heavy on boxwood, azaleas, holly and other plants in GEORGIA.

A SPITTLEBUG (Clastoptera arizonana) was a serious pest of acacia trees in CALIFORNIA, and C. juniperana was light on ornamental juniper in southern Washoe County and light to moderate on native juniper in Lincoln, Nye and southern Washoe Counties, NEVADA. Also in Nevada, adult populations of unspecified CICADAS were heavy, with heavy egg laying noted on juniper, pinyon pine and various shrubs in Lincoln County during June. A CICADA (Magicicada sp., possibly M. cassini) emerged in large numbers in several areas of OKLAHOMA during June, but damage was light in most areas. Another CICADA (Diceroprocta apache) populations were heavy in ARIZONA and numerous egg laying punctures caused severe damage to many ornamental and fruit trees during the summer in most areas of the State.

AZALEA LACE BUG (Stephanitis pyrioides) caused considerable damage to many untreated azaleas during late May and June in New Castle County, DELAWARE, and caused noticeable damage to several azalea plantings in southern areas of MARYLAND. Azalea lace bug infestations were general and heavy on azalea over GEORGIA during the past season. Unspecified LACE BUGS were damaging to azaleas, cherry, pyracantha and ornamental sycamore in ALABAMA, and damaged ornamentals in one or more areas of TEXAS, where they caused general concern.

FOUR-LINED PLANT BUG (Poecilocapsus lineatus) was more prevalent than usual in MASSACHUSETTS where it caused considerable injury to the foliage of some flowers and other ornamentals, and was troublesome on garden flowers in PENNSYLVANIA. TARNISHED PLANT BUG (Lygus lineolaris) was also troublesome on garden flowers in

Pennsylvania and was common statewide in RHODE ISLAND. Large numbers of a RHOPALID BUG (Niesthrea sidae) infested ornamental shrubs in Marion County, TEXAS.

CUBAN-LAUREL THRIPS (Gynaikothrips ficorum) infestations in CALIFORNIA are limited to Ficus spp. in southern coastal areas where populations were damaging during the 1964 season in Orange, Los Angeles and San Diego Counties. Unspecified THRIPS were more prevalent on native shrubs in California than in former years and were quite heavy on cut flowers. Several species of thrips damaged ornamentals and were of general concern in several areas of TEXAS, and were often damaging to roses in ALABAMA this past season. Unspecified species damaged choice roses in Providence, Providence County, RHODE ISLAND, during late June.

EUROPEAN EARWIG (Forficula auricularia) was heavy on marigolds in Lackawanna County, PENNSYLVANIA. Three new infestations of this pest were found in Ingham County, MICHIGAN, and infestations were reported for the first time from Wexford, Ionia and Lenawee Counties. European earwig was a problem in and around homes and damaged flowers in home gardens in the Santa Fe area of Santa Fe County, NEW MEXICO. Also in New Mexico, occasional specimens of RING-LEGGED EARWIG (Euborellia annulipes) were found in homes and greenhouses in the Las Cruces area of Dona Ana County.

A medium infestation of WESTERN DRYWOOD TERMITE (Incisitermes minor) was found in partially dead ornamental ash trees in southern Washoe County, NEVADA. This constituted a new county record and was the second record for the State.

TWO-STRIPED WALKINGSTICK (Anisomorpha buprestoides) was a problem in the Stone Mountain area of GEORGIA during the 1964 season on aucuba, privet and pittosporum.

BOXWOOD LEAF MINER (Monarthropalpus buxi) adult emergence occurred May 26 in Kingston, Washington County, RHODE ISLAND, and abundance was normal during the 1964 season. Some infestations, especially of English boxwood, were reported in VIRGINIA, and heavy infestations were noted in the Atlanta area of GEORGIA. NATIVE HOLLY LEAF MINER (Phytomyza ilicicola) caused considerable damage to holly in a number of areas in GEORGIA and was medium to severe on American holly in various parts of VIRGINIA. Native holly leaf miner was common in American holly in all sections of MARYLAND, with adults first emerging on May 5 in the College Park area of Prince Georges County. This leaf miner fly was of little concern in OHIO during the 1964 season. COLUMBINE LEAF MINER (P. minuscula) was very abundant in columbine during May in Sussex County, DELAWARE. Several leaf miner flies, Liriomyza sp., L. trifolii and Phytobia maculosa, were severe on untreated pompons in the Bradenton area of Manatee County, FLORIDA.

NARCISSUS BULB FLY (Lampetia equestris) infestations increased 10 percent on untreated narcissus bulbs in the Puyallup Valley of WASHINGTON during 1964 and increased on bulbs shipped in from out of the State.

BIRCH LEAF MINER (Fenusa pusilla) was of concern on ornamental birch in several Eastern States. The pest was numerous and general in PENNSYLVANIA. Populations were spotty and serious only in limited areas in NEW YORK. Birch leaf miner was locally abundant in CONNECTICUT, and adults were active throughout RHODE ISLAND on May 9 and again on June 23. The first generation in Rhode Island was heavy and the second generation light, as is the usual pattern. Birch leaf miner was damaging to ornamental birch in VERMONT and infestations were observed in NEW HAMPSHIRE. This sawfly was generally heavy throughout MAINE. High populations caused severe damage to ornamental birches in the State, particularly gray birch, with some damage to white birch observed. Also in Maine, MOUNTAIN-ASH SAWFLY (Pristiphora geniculata) occasionally damaged mountain-ash in various areas about July 2.

EUROPEAN PINE SAWFLY (Neodiprion sertifer) was more common on ornamental pine trees in OHIO than usual. Egg hatch of this sawfly occurred in several areas of southern MICHIGAN during late April and considerable larval injury to Christmas tree plantations of Scotch pine occurred in May. In NEW YORK, European pine sawfly caused severe defoliation of Scotch pine and other ornamental pines as a result of the mild winter of 1963-1964, which permitted an abundance of eggs to overwinter. Defoliation of these hosts occurred in many scattered areas over New York during the 1964 season. In RHODE ISLAND, a GALL WASP (*Diplolepis* sp.) was very common on *Rosa rugosa* in the Charlestown area of Washington County in late May.

A CARPENTER BEE (*Ceratina dupla*) was abundant and injurious to rose canes in PENNSYLVANIA during the 1964 season.

SPIDER MITES were also of some concern in various areas during the 1964 season. TWO-SPOTTED SPIDER MITE (*Tetranychus telarius*) was a common pest in greenhouses and on houseplants in ALASKA, and was considered quite serious on street and yard trees as well as other ornamentals in many locations over CALIFORNIA. Two-spotted spider mite was present on ornamental deciduous and coniferous trees and ornamental shrubs in COLORADO. Damage by this pest ranged moderate to severe on ornamental evergreens throughout WYOMING. Mites could be found on almost all bushes and trees checked in all areas of the State this season. A large amount of winterkill in ornamentals, however, was mistaken for mite damage in the southeastern area of the State. Infestations of this spider mite were about the same as those present during the 1963 season in Wyoming. Light to moderate damage by two-spotted spider mites was common on ornamental spruce over NORTH DAKOTA. Two-spotted spider mite was serious on roses in the Boynton Beach area of Palm Beach County, FLORIDA.

DESERT SPIDER MITE (*Tetranychus desertorum*) damaged creosote plants in a greenhouse in the Cleveland area of Cuyahoga County, OHIO. Determination was made by D. M. Tuttle of the University of Arizona. Also in Ohio, SPRUCE SPIDER MITE (*Oligonychus ununguis*) continued to be one of the most common pests in nurseries in the State. Populations of this spider mite were again heavy on ornamental spruce and other needled evergreens throughout INDIANA. Many requests for assistance in the control of this spider mite were received throughout the 1964 season. Spruce spider mite was exceedingly abundant on ornamental spruce in PENNSYLVANIA, especially in the southwestern section of the State, where much webbing was evident. In RHODE ISLAND, there were scattered complaints concerning spruce spider mite from all parts of the State.

SOUTHERN RED MITE (*Oligonychus ilicis*) was severe on ornamentals throughout LOUISIANA early in the season. In OHIO, a HONEYLOCUST SPIDER MITE (*Eotetranychus multidigituli*) was more common during the 1964 season than usual.

Various other spider mites caused some degree of damage to ornamentals. An unspecified species heavily damaged ornamental oaks in the Middlesex area of Washington County, VERMONT, and other species were generally heavy on many ornamentals and shade trees in NEW JERSEY this season. *Oligonychus bicolor* was heavy on ornamental oaks in New Castle County, DELAWARE. *O. milleri* was found for the first time in PENNSYLVANIA during 1964 in a Scotch pine Christmas tree plantation in Indiana County during June, where the pest caused considerable yellowing of trees. The infestation was spotted, but quite general throughout the plantation. Unspecified spider mites caused considerable damage to a variety of ornamental plants throughout VIRGINIA and were reported as heavy on a hemlock hedge. *Eotetranychus lewisi* caused considerable defoliation of poinsettias in the Miami area of Dade County, FLORIDA. *Oligonychus* sp. was not as numerous, or at least not as damaging in Florida in 1964 as usual on ornamentals. Spider mites were very damaging to ornamental shrubs and roses in ALABAMA. Several species of spider mites damaged ornamentals in TEXAS where they caused general concern in one or more areas, and *Tetranychus* spp. were active in OKLAHOMA. Spider mites infested ornamentals and shade trees to varying degrees in NEBRASKA, but were not a problem in MINNESOTA until late in 1964 season. Large numbers of unspecified MITES occurred on ornamental and shade trees in CALIFORNIA. Late infestations were damaging in the State and in many instances occurred too late for controls to be effective. Unspecified SPRUCE MITES were frequently found on ornamental spruce in ALASKA.

PRIVET MITE (Brevipalpus obovatus) infested privet in several locations over CALIFORNIA during the season.

Some species of ERIOPHYID MITES were reported as annoying and damaging during the 1964 season. Nalepella tsugifoliae caused unthrifty hemlock plants in a nursery in South Kingston, Washington County, RHODE ISLAND. Damage was less obvious during 1964 than in 1963. Determination was made by H. H. Keifer. N. tsugifoliae has been abundant on Long Island, NEW YORK, for two years, and during the 1964 season, was found in nurseries in the Hudson Valley and in Lockport, Niagara County, where it apparently had been imported on nursery stock from out of the State. Unspecified species infested several species of ornamental and shade trees in MINNESOTA, where terminal growth of ash was often seriously damaged, and sometimes killed, by damage to new buds. Unspecified eriophyid mites damaged camellias in several areas of GEORGIA, where they were more common than usual. An unspecified species caused galls on leaves of ornamental ash trees at Mesilla Park and another formed galls on the female flowering parts of ornamental cottonwood trees near Hatch, both in Dona Ana County, NEW MEXICO. In CALIFORNIA, Aceria camelliae was heavy locally on camellia plants; Oxypleurites carinatus was heavy on horsechestnut trees in San Mateo County; Trisetacus quadrisetus was quite heavy on juniper; and Aculus ligustri infested privet in several locations.

CYCLAMEN MITE (Steneotarsonemus pallidus) was serious on a commercial planting of African-violets in the Matanuska Valley of ALASKA. BULB MITE (Rhizoglyphus echinopus) was heavy on Easter lilies in a greenhouse in North Providence, Providence County, RHODE ISLAND, in February of 1964.

SLUGS and SNAILS were ever present, annoying and often damaging pests on small, low growing base and border flowers in ALABAMA during the 1964 season.

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